



LECTURES

ON THE

SCIENCE OF HUMAN LIFE.

BY

SYLVESTER GRAHAM.

Know thyself.

IN TWO VOLUMES.

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LECTURE XIII.

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§ 768. FROM the laws of constitution and relation which have been explained in the preceding lecture, we perceive that, as a general statement, the simpler, plainer, and more natural the food of man is, the more perfectly those laws are fulfilled, and the more healthy, vigorous, and long-lived will be the body,—the more perfect will be all the senses, and the more active and powerful may the intellectual and moral faculties be rendered by suitable cultivation. (§ 735. 775.)

§ 769. It is unquestionably true that for a considerable time—probably centuries, after man was created, he received his food from the bosom of nature, with very little or no artificial preparation. Flouring-mills and bolting-cloths, and the innumerable culinary and other utensils since employed in preparing aliment for the human mouth and stomach, were then wholly unknown.

§ 770. Now then, one of two things is entirely certain;—either God created man with a perfect constitutional adaptation to the state in which he first placed him, and with a constitutional capability of adapting himself, to a certain extent, to that artificial state in which man has since placed himself;—or else, God created man with a perfect constitutional adaptation to the state and circumstances of civic life, and placed him at first, in a state to which he had a constitutional capability of being adapted, but which was not best adapted to his constitution.—No enlightened and honest mind, I suppose, can hesitate a moment to decide that the first of these positions is the true one:—that God created man upright, but capable of seeking out many inventions:—that He placed him at first, in a state for which he had the most perfect constitutional adaptation, and which was most perfectly adapted to his constitution;—and hence, it should ever

be remembered that man was constituted for the natural state, (§ 25. Note) and not for the artificial state of civic life: and all that can be truly affirmed more than this, is that, man possesses a constitutional capability of educating and habituating himself to artificial modes of life:—but in so doing, he necessarily impairs the physiological powers of his constitution, and, as a general fact, abridges the period of his existence. (§ 735.) I wish however, to be perfectly understood, when speaking of the natural and of the artificial state of man. By the *natural state* of man, I do not by any means, intend the savage state:—for I do not believe that the savage state is natural to man. (§ 774.)

§ 771. As an animal, man is constituted with the same physiological powers, and upon the same great physiological principles as those which pertain to the constitutional nature of the horse, the ox and other animals; and it is well known that these animals cannot be greatly diverted from their natural laws of constitution and relation, without a deterioration of their natures: and this is equally true of the animal nature of man. We have seen (§ 694. *et seq.*) that, God has constituted the organized body of man, with fixed and precise relations to those substances which He designed for its nourishment:—that He has formed the human body with organic capacities and physiological powers, (§ 697.) to receive and convert those foreign substances to its own nature, and that, in connexion with these organic capacities and physiological powers, and with fixed and precise relations to the kind, quality and condition of those foreign substances designed for human aliment, He has established certain special senses (§ 700.) as the faculties of instinct, by which the animal, in a natural and undepraved state, with unerring accuracy, selects his

salutary nourishment, and avoids whatever is pernicious.

§ 772. These faculties of instinct then, are as determinate in their functional characters and in their *final causes*, in man, as they are in the lower animals: (§ 707.) and God no more designed that man should find enjoyment in the exercises of these instinctive faculties, beyond the legitimate fulfilment of their *final causes*, than He did, that, the horse and ox and other animals should. And I affirm this, on the authority of the incontrovertible fact, that man is constituted with no more capability to do it, without injury to himself than the lower animals are. (§ 735.) In all that concerns the interests of organic life and mere animal existence, therefore, man is subject to the same general laws as those which govern the lower animals: and in one respect only, has God made man, as an animal, superior by his organization to other animals,—and *that* involves no physiological law, and constitutes no physiological distinction between man and other animals. Nor indeed, does it elevate man above other animals, except in its adaptation to his higher faculties, as a voluntary power,—as an organic instrument, by which man is enabled to execute the designs of his mind. The monkey has a hand and arm like man; but without the reason of man, his hand serves in no degree to elevate him above many other animals. But the human hand, as the instrument of human reason, has elevated man to the heavens, and plunged him into the deepest hell.—It is indeed, to him, more than the fabled wand of the magician, and is only second to the omnific power of God.

§ 773. In the possession of his immeasurably superior intellectual and his peculiar moral powers, then, (§ 612.) is man exalted far above all other terrestrial beings, and

made the natural lord of the earth and sea; and holds a natural dominion over all the animal as well as vegetable and mineral kingdoms.—Still, man, in common with all created things, is a subject of the great natural kingdom of God, which of necessity, is governed by the supreme constitutional laws that God, in infinite wisdom and benevolence, has established in the nature of things: (§ 613.) and therefore, man has no *natural dominion* over the things of this world, nor is it possible for him to acquire a dominion, which will enable him to abolish the constitutional laws of things under his dominion, nor the constitutional laws of his own nature; nor with impunity to violate any of the constitutional laws of God's great natural kingdom, whether established in his own nature, or the nature of any other created thing.—(§ 144.) *Man's superiority therefore, consisteth not in his own absolute and arbitrary power:—but in the superior constitutional nature and intrinsic capabilities which God has given him.* By a conformity to the laws of that constitutional nature, he rises in the development of his capabilities to an affiliation with angels, and to a holy and happy communion with God:—but by the transgression of those laws he inevitably sinks to the perdition of necessary consequences.

§ 774. It is therefore a very obvious and an incontrovertible truth, that *the truly natural state of man*, or that state to which God has adapted the constitutional nature of man, is that, in which his organic and animal powers, and all that primarily appertains to his organic and animal nature, are kept in strict conformity to the physiological laws of that nature, and in which his intellectual and moral powers are cultivated to godlike wisdom and virtue. For, the constitutional laws of man's intellectual and moral nature, which are establish-

ed with fixed and precise relations to his animal and organic nature on the one hand, and to the moral character of God and the moral interest and duties of society on the other, (§ 613.) as much require such a cultivation of his intellectual and moral powers, as the highest welfare of his organic and animal nature requires the strict obedience of its physiological laws. And we have seen (§ 613.) that, the physiological laws and the moral laws of man's constitutional nature, perfectly harmonize, so that, the true interests of his intellectual and moral nature cannot be adverse to, nor, in the present state of being, separated from the true interests of his organic and animal nature.—Moreover, it is not only true that, the highest degree of intellectual and moral cultivation and refinement are compatible with the simplest and most natural dietetic regimen, but it is incontrovertibly true that such a regimen is most favorable to the highest and holiest development of man's intellectual and moral powers.

§ 775. But when I say (§ 768.) that, the simpler, plainer and more natural the food of man is, the more perfectly his laws of constitution and relation are fulfilled, and the more healthy, vigorous and long-lived will be his body—the more perfect his senses, and the more active and powerful may his intellectual and moral faculties be rendered by suitable cultivation, I do not mean that man is constituted to eat grass like the horse and ox, nor that he should confine himself to a single article of food during his life. By simple food I mean that which is not compounded and complicated by culinary process;—by plain food I mean that which is not dressed with pungent stimulants, seasonings or condiments; and by natural food I mean that which the Creator has designed for man, and in such conditions as are best adapted to

the anatomical structure and physiological powers of the human system.—Among all the vegetable and animal substances in nature, which afford nourishment for living animal bodies, there are some better adapted to the constitutional nature of man than others: and some, which above all others, are adapted to sustain human nature in its highest and best condition. These latter substances, whatever they may be, are the most natural food of man, and the more entirely man subsists on them, the more perfectly he fulfils the laws of his nature, and secures his highest interests.

§ 776. In turning to the general history of the human race, for a confirmation of these physiological principles, so many difficulties meet us almost at the first step, that we feel exceedingly perplexed and discouraged: and nothing but the true light of physiological science, and the most cautious and scrutinizing investigation of every thing that comes in our way, can save us from being continually misled by the false way-marks, which have, on every hand, been set up by those who have preceded us.

§ 777. The present condition of the human family, taken as a whole, is a tolerably fair specimen of what it has been, on an average, for several thousand years. And if we contemplate the present condition of mankind, over the face of the whole earth, the first view seems to present nothing which goes to confirm the physiological principles that I have advanced. We find some portions of the race in the torrid zone, some in the temperate and some in the frigid. (§ 15.) Some, we find subsisting wholly on vegetable food, others on a mixture of vegetable and animal, and others entirely on animal, or nearly so; and those tribes and portions of the human family, who appear to come nearest to a pure

state of nature, in the kind and condition of their food, present no advantages over others of more artificial habits of living. (§ 657.) But if we examine this matter with a more careful and penetrating eye, we shall soon discover that all facts of this kind are completely nullified by circumstances which wholly destroy the integrity of the experiment.

§ 778. It is a melancholy truth, that, at least nine hundred and ninety-nine, in every thousand members of the human family, at present existing on the surface of our globe, in the most savage as well as the most civilized life, daily and constantly disturb the physiological functions and impair the physiological powers of their bodies, by the use of those alcoholic, narcotic and other substances which are taken purely for their stimulating effect, and which completely destroy, for any nice physiological purposes, all general facts in relation to the dietetic habits of man.—That foul and loathsome weed tobacco, has found its way to every part of every continent and island, and over the whole face of the waters of our globe. It is freely used in all grades of society, from the most elegant and refined portions of civic life, to the lowest state of savage existence in Europe, Asia, Africa, and America.—Alcohol in some of the numerous forms of fermented or distilled liquors, is scarcely less universally used;—and opium is consumed in nearly an equal quantity.—Tea, coffee, and numerous other articles of the same great family of deleterious stimulants, are, over a considerable portion of the globe, almost as common as the atmospheric air, and are considered almost as necessary to the stomach as air is to the lungs.—Besides these evils which abound in savage life, filthiness, licentiousness, the uncurbed exercise of all the bad passions, great irregularities, a want of intellectual and moral

cultivation, and a thousand other things militate continually against the physiological welfare of those, whose dietetic habits may, in many respects, be simple and natural; and totally prevent the advantages which would otherwise flow from such a diet.—No amount of facts of this kind, therefore, ought ever to be considered as of any real weight against well ascertained physiological principles;—for nothing can be more certain than that, every real fact in the experience of the human race, when truly understood, decidedly confirms the truth of physiological science.

§ 779. All the writers of antiquity, of every nation,—historians, physicians, philosophers and poets, assert that the first generations of men, who lived nearly a thousand years, (§ 641.) were perfectly natural and simple in their diet.

a. According to the Mosaic record, God said to the first parents of the human species, “Behold, I have given you every herb bearing seed, which is upon the face of the earth; and every tree in which is the fruit of the tree, yielding seed; to you it shall be for food.” And again, after the transgression, God says to Adam, “Thou shalt eat the herb of the field;—in the sweat of thy brow shalt thou eat thy food till thou return unto the ground.”

b.- Sanchoniathon, a Phœnician historian, who flourished about four hundred years after Moses, says that “the first men lived upon the plants shooting out of the ground.”

c. Hesiod, the Greek poet, who is supposed to have flourished two or three hundred years later, speaking of the food of the first of those tribes and nations of which he had a historical and traditional knowledge, says that “the uncultivated fields afforded them their fruits and supplied their bountiful and unenvied repast.”

d. Pythagoras, the philosopher, who flourished about five hundred years before Christ, and who travelled extensively, and made himself acquainted with all the learning of his day; and in all his researches, made the history and philosophy of man the principal objects of his inquiries and studies, gives the same account of the dietetic habits of the primitive generations: and he taught his more favored disciples that they ought to live in the same natural and simple manner.

e. Herodotus, the celebrated historian, who wrote about four hundred and forty-five or fifty years before Christ, relates that, "upon the death of Lycurgus, the Lacedemonians, meditating the conquest of Arcadia, were told by the oracle that there were many brave acorn-eaters in that country, who would repel them if they attempted to carry their arms thither:—as it afterwards happened."

f. Hippocrates, called the father of physic, who flourished about four hundred years before Christ, and who was a physician of great talents and extensive observation and research, says that "in the beginning man subsisted on the spontaneous products of the earth, and received his food in the same simple and natural condition as the lower animals did."

g. Diodorus Siculus, who flourished about forty or fifty years before Christ, and who wrote the history of Egypt, Persia, Syria, Media, Greece, Rome and Carthage, says that "the first of men ranged over the fields and woods in search of food, like the lower animals,—eating every mild herb they could find, and such fruits as the trees spontaneously produced."

h. Ovid, the celebrated Roman poet, who flourished in the commencement of the Christian era, and who undoubtedly speaks from the historical and traditional authority of his day, says, in the first Book of his

Metamorphosis, in relation to the diet of the first generations of men, as rendered by Dryden—

“Content with food which nature freelybred,
On wildings and on strawberries they fed;
Cornels and bramble-berries gave the rest,
And falling acorns furnished out the feast.”

i. Ælianus, who in the first century of the Christian era, published his treatises on animals, history, &c., says that “the diet of the primitive inhabitants of the earth differed according to the different products of their respective countries.”—Of the first inhabitants of Greece he says, “The Arcadians lived on acorns, the Argives on pears, the Athenians on figs,” &c.

j. Pliny, the Roman naturalist, of about the same period, says that “mankind in the first ages subsisted on acorns.”

k. Plutarch, who died about the middle of the second century of the Christian era, relates that “the first Argives, led on by Inachus” the founder of the kingdom of Argos, 1800 years before Christ, “searched the woods for wild pears to support them.” The same writer, in his life of Artaxerxes Longimanus, king of Persia, who reigned in the fifth century before Christ, says that, “this unwary prince led a great army against the Cadusians, a robust and warlike people, whose inhospitable country produced neither corn nor good fruits, so that, the natives were forced to live on pears and apples which grew wild and spontaneous.”

l. Galen, the celebrated Roman physician, who flourished in the second century of the Christian era, seems to admit the truth of all these accounts, for he assures us in his work on human aliment, that, “acorns afford as good nourishment as many sorts of grain:—that, in ancient times men lived on acorns only; and that, the

Arcadians continued to eat them long after the rest of Greece had begun to make use of bread-corn."

m. Porphyry, a platonic philosopher of the third century—a man of great talents and learning, and of very extensive research and observation, who investigated the subject of human diet with great care and diligence, says that, "the ancient Greeks lived entirely on the fruits of the earth."

n. It is well known also, that the Romans, not only in the earliest period of their history, but at the time of their greatest vigor and efficiency, when their small and invincible armies were always victorious, and when the success of battle depended less on the art of war than on the physical power and personal prowess of the individual leaders and soldiers, were exceedingly simple and natural in their diet;—and it was not till the artificial refinements and the excesses of luxury, had relaxed their sturdy frames and rendered them effeminate, sensual and selfish, that they were unable to withstand even the smaller numbers, of those rugged barbarians whom they affected to despise. (§ 648.)

o. When Bonduca, queen of the ancient Britons, was about to engage the Romans in pitched battle, in the days of Roman degeneracy, she encouraged her army with a pathetic speech in reference to the wrongs and outrages which they had suffered from their foreign oppressors, and urged in particular, the following considerations: "The great advantage we have over them, is that they cannot like us, bear hunger, thirst, heat, nor cold. They must have fine bread, wine and warm houses.—Every herb and root satisfies our hunger, water supplies the want of wine; and every tree is to us, a warm house."—"In those times," says the noble historian, on whose authority I state this, "our fathers were

robust both in mind and body, and could bear without much pain, what would totally overwhelm us.”*

p. Even the aborigines of our own country, with all their fondness for the chase, before their intercourse with the Europeans, subsisted to a considerable extent, on the simple products of the earth. The Plymouth colonists found the North American Indians, inhabiting those parts, under Massasoit, the father of that American Wallace, King Phillip, subsisting on the plainest and simplest forms of food; and possessing noble and hardy frames and frank and friendly dispositions;—remarkable for bodily symmetry and vigor and activity, and ability to endure severe and protracted labor and exposure. Ground-nuts and acorns and bread made of parched maize or Indian corn, were the principal articles which Massasoit, in generous and unsuspecting hospitality, served up for the repast of his first white guests.—A writer of those early days of our antiquities, informs us that, “the Indians made a bread from the meal which they made of parched maize:”—and that, “it was so sweet, so hearty and so *toothsome*, that, an Indian would travel many days with no other food.”—And indeed, it was no uncommon thing for an Indian, starting on such a journey, to take three or four ears of corn with him as his only food which he would either eat raw, or stop by the way and make a fire and parch it as he needed it.

q. For a considerable time, during the severe war which he maintained in his last struggles for his beloved country, that noble and heroic patriot, and martyr to the cause of liberty, King Philip, with his few and faithful followers, “subsisted on ground-nuts and acorns and lily-roots.”—And when Colonel Church captured Anna-wan, a chief officer under Philip, he found his wife

* Kains' Sketches on Man.

engaged in pounding parched corn for supper. And, taking advantage of this rude, but still lovely sound of domestic charity, he stole like the primal serpent, into the sanctuary of peace, to betray and to desolate!—Virtuous simplicity of a noble race!—Who can covet the moral sensibilities of that man who has no sympathies for scenes like these!—Most injured race!—Full many a generous heart hath ached at the contemplation of your untold wrongs!—Treacherously robbed of your country, and then cruelly exterminated as savages, because you were guilty of loving the spot of your birth, and the land of your fathers' sepulchres!

No more upon yon silver tide
That winds these mountain spires between—
No more along the upland side,
The native huntsmen now are seen:
Their bodies have manured the soil,
For other lords and other heirs;
Their homes became the bloody spoil
Of hearts less merciful than theirs.

§ 780. But, in contemplating the history of the human race, we must not lose sight of the fact, that no ancient historian except Moses, gives us any direct and distinct information, concerning the antediluvian inhabitants of the earth:—and another interesting fact, is that, no other early writer gives us an account of the diet of the primitive generations of the human race, which is so rational, and so truly adapted to the constitutional nature of man. For, according to Moses, “the Lord God planted a garden, and caused every tree that is pleasant to the sight and good for food, to grow out of the ground; and he took the man whom he had formed, and put him into the garden of Eden to dress it and to keep it,” and to subsist on its fruits. Such then, is the truly natural state of man; and such is the food which is adapted to the

highest and best condition of human nature.—And when man, by his disobedience, had caused his own expulsion from this delightful garden, and was doomed to eat his food in the sweat of his brow, instead of roaming through the fields and woods like beasts in search of food, we find him soon practising both husbandry and pasturage. For Cain, the oldest son of Adam, was a tiller of the ground, and Abel, the second, was a keeper of sheep.

§ 781. Fruits, nuts, farinaceous seeds and roots, with perhaps some milk and it may be honey, in all rational probability, constituted the food of the first family and the first generations of mankind.

§ 782. These articles were, at first, unquestionably received in their natural and simple state, without any artificial preparations at all, except the rude breaking of the hard shells of nuts, with the common stones on the face of the earth. But as society advanced, and the change of seasons taught men by experience, the necessity of a degree of providence, and as their provisions of seeds and other articles of food became dry and hard by keeping, they very naturally had recourse, at first, to the simple expedient of mashing or breaking those substances on flat stones, preparatory for mastication.—And soon it became a general custom among them, for every family to keep one or more of these stones, as a necessary part of their domestic apparatus.—By constant use, these stones, in a process of time, became concave and deeply hollowed, which rendered them much more convenient. This led to the manufacture of stone mortars, which took the place of the flat stones, as household utensils, for breaking and preparing the dry and hard articles of food. There is reason to believe that no farther improvements were made in this line, anterior to the flood.—The food, which was broken in this rude but healthful manner, was

probably sometimes parched, before it was submitted to the processes of the mortar; and afterwards, portions of it were perhaps, wet up with simple water, into a coarse dough, which was baked on heated stones, or in heated earth or ashes, or in the rude ovens of the times.

§ 783. This is probably, the full extent, to which the artificial processes of preparing food were carried in the antediluvian period of the world. And there is obviously nothing, in all this, which takes away the necessity for the full performance of the function of the teeth, (§ 719.) and there is no concentration—no pernicious combinations or compounds, (§ 760.) no insalutary culinary processes which violate the laws of relation in regard to the teeth, guins, salivary glands, organ of taste, stomach or any of the alimentary organs of the human body. (§ 723.) These organs were therefore, preserved in all their constitutional energies and unimpaired powers,—sustained by appropriate and healthful aliment, and being thus sustained, in all their primeval vigor and integrity, elaborated for the vital wants of the whole system, a full supply of nourishment which was most conducive to good and permanent health and long life.

§ 784. In circumstances, and with habits such as these, unblighted with hereditary taint,—with constitutions little enervated by ancestral sensuality, it is no marvel that the antediluvians and all others in such circumstances and conditions, and with such habits, should average several centuries of life, and that some of them should walk erect with patriarchal dignity, almost to the summit of a thousand years! (§ 644.)

§ 785. With all the deteriorations of six thousand years, accumulated on the vital energies of man, (§ 648.—653.) the human constitution even yet, where circumstances and conditions and habits concur to fulfil perfect-

ly the physiological laws of man's constitutional nature, has power to climb far up, towards the top of primitive longevity, with much of primitive development and symmetry and vigor and elasticity of body. (§ 683.)

§ 786. Captain Cook, the celebrated navigator, tells us that, when he first visited the New Zealanders, he found them enjoying perfect and uninterrupted health. (§ 778.) In all the visits he made to their towns, where old and young men and women crowded about the voyagers, they never observed a single person who appeared to have any bodily complaint; nor among the numbers that were seen naked, was once perceived the slightest eruption of the skin; nor the least mark which indicated that such eruptions had formerly existed.—Another proof of the health of this people, was the facility with which the wounds they at any time received, healed up. In a man who had been shot with a musket ball, through the fleshy part of the arm, “his wound seemed so well digested and in so fair a way to be healed,” says Captain Cook, “that if I had not known that no application had been made to it, I should have inquired with very interested curiosity, after the vulnerary herbs and surgical art of the country. An additional evidence of the healthiness of the New Zealanders, is in the great number of old men found among them.—Many of them appeared to be very ancient, and yet none of them was decrepit. (§ 688.) Although they were not equal to the young in muscular strength, they did not come in the least behind them in regard to cheerfulness and vivacity.”

§ 787. This statement is strikingly corroborated by the testimony of Mr. William Bryant, a respectable merchant of Philadelphia, who in the year 1809, went with a company of a hundred and twenty men, under the United States Government, beyond the Rocky Mountains, to

conduct to their far western homes, the Indian chiefs who were brought to the seat of government by Lewis and Clark. Mr. Bryant states that the company carried their provisions of food, tobacco and spirits with them, until they had exhausted them in the western wilds, where they were far beyond the reach of any supplies.—From that time, during their whole stay of about two years among the Indians, the company subsisted entirely, as the Indians did, on the flesh of the wild buffalo and other game, with such esculent fruits and roots as the forest afforded, and water. They had no alcoholic nor narcotic substance, nor any other pure stimulant to use, (§ 743.) not even salt with their flesh-meat, which at first, they burnt a little to destroy its fresh and natural taste: but they soon learned to relish their flesh-meat very highly without salt, even when slightly cooked.—Most of the men belonging to the company, were, when they left the United States, more or less disordered in their health and afflicted with chronic ailments. They were all restored to health, and became, like the Indians among whom they dwelt, remarkably robust and active. Their wounds healed in the same manner as stated by Captain Cook of the New Zealanders. One of the company had the fleshy part of his leg torn off by a bear. The Indians stripped some bark from a tree for a bandage, and did up the wound with a little bears' oil: and it healed with astonishing rapidity,—apparently without inflammation, and entirely without pain. Mr. Bryant assures me that, so little did the natives regard the pain of cutting or wounding their flesh, that it was no uncommon thing, for them on any very special and important occasion, to cut off one of their fingers, and present it to a friend as a memorial, or to an opposite party as a pledge;—and he saw

several individuals, with only the thumb and fore-finger left on one hand. (§ 778.)

§ 788. The Pampa Indians, of Buenos Ayres in South America, live almost entirely on mares' flesh and water. They wear little or no clothing and sleep on the ground in the open air. When not sleeping, they are almost continually on horseback, and being accustomed to this kind of exercise from childhood, they acquire the power to ride very great distances with comparatively little fatigue. "The mares' flesh which they eat," says Sir Everard Home, "is tough and lean, so that they only satisfy hunger and never grow fat: but when they accidentally get a buffalo and indulge much in eating fat, it makes them feverish and takes away their appetite. By fasting a day or two however, they get well. They are in general a well-made, stout race of men; and appear to be subject to no diseases.—By virtue of the great simplicity of their diet and their constant exercise on horseback, in the open air, they enjoy remarkable uniformity of health, and many of them are very athletic and capable of great endurance, especially in those feats and exploits which are performed on horseback.—Captain Head, after living for three months among these Indians, on flesh and water, and being constantly on horseback, became so hardy as to tire ten or twelve horses in a day, and galloped one hundred and fifty-three miles without halting—remaining on horseback fourteen hours and a half before he arrived at the end of his journey.—A French gentleman of Captain Head's party told me," continues Sir Everard, "that he himself, a slim man, after living some months on flesh and water and becoming accustomed to riding on horseback, rode one hundred miles a day without fatigue. A friend of Dr. Babington's who lived

in the Pampas for some time as a missionary, assured the doctor, that he was astonished to find that upon this simple diet, he was able to ride more than a hundred miles daily without fatigue." (§ 778.)

§ 789. Some of the tribes of the Arabs of the desert, according to Captain Riley, subsist entirely on the milk of their camels. Those who adhere strictly to this diet, have no sickness nor disorders, and attain to very great age, with remarkable vigor and activity. (§ 688.) Captain Riley thinks he met with some who were three hundred years old, and many who were strong and active at the age of two hundred years. "I am fully of opinion," says he, "that a great many Arabs on this vast desert, actually live to the age of two hundred years and upwards. Their lives are regular from birth to death:—their food is simple, plain and nutritious, and without variation:—their climate is dry and not changeable:—they are not subject to hard labor, yet have sufficient exercise for the purposes of health:—they never taste of wine nor ardent spirit; it being forbidden by their religion."

§ 790. Almost every circumstance in the lives of these Arabs is unquestionably in a high degree favorable to health and longevity; and the statements of Captain Riley, if correct, clearly and fully show that, the most perfect simplicity and uniformity of diet are most highly conducive to human health and strength and long life.

§ 791. Homer also, describes a race of men inhabiting the mountains of ancient Sarmatia—an extensive country at the North of Europe and Asia, who he says subsisted upon the milk of mares, and lived to very great age and were "the justest of men."

§ 792. Before the discovery of the Ladrone islands by the Spaniards, about the year 1620, the inhabitants supposed themselves the only people in the world: and

they were destitute of almost every thing that people in civic life think necessary to existence. There were no animals on the islands except birds, and these they did not eat.—They had never seen fire, nor could they at first imagine the properties or the use of it.—Their food was wholly vegetable; consisting of fruits and roots in a natural state. They were well formed, vigorous and active, and could carry with ease upon their shoulders, a weight of five hundred pounds.—Disease or sickness of any kind was scarcely known among them: and they generally attained to great age. It was no extraordinary thing for individuals among them to reach a hundred years without experiencing any sickness. (§ 778.)—Since they have become accustomed to the use of fire in preparing their food, and have deviated considerably from their former, simple and natural manner of living, diseases are much more common among them, and they do not average so great an age.

§ 793. Modern travellers inform us that the inhabitants of the island of Malta, are remarkable for their plain, simple and abstemious diet, and active and industrious habits: and that longevity is not unusual among them:—many of them living a hundred years. (§ 778.)

§ 794. The great uniformity of health, the remarkable bodily vigor and activity, and the extraordinary longevity, of those inhabitants of Russia, whose food is simple, plain and coarse, and who wholly abstain from the use of spirits, tobacco, opium and other intoxicating substances, are well known to all who are acquainted with the present history of the human family. (§ 778.)

§ 795. It is a notorious truth, that when, from religious or other motives, any sect or society of men are induced to adopt and perseveringly observe a simple and restricted regimen, their bodily health and longevity are as much improved and increased as their virtue and piety.

§ 796. The ancient Bramins of India, were restricted by their religious principles to the most simple and natural diet; and it is well known that so long as they rigidly and uniformly adhered to their religious principles in regard to their diet, they enjoyed the most uniform health and attained to great age;—and, considering the circumstances under which they lived for many centuries, they were an eminently virtuous and excellent class of men.

§ 797. Pythagoras founded his dietetic system on principles which he received from the Bramins of India, and the sect of Essenes among the Jews received and adopted the Pythagorean system;—and what I have said of the Bramins, in relation to the effects of their simple diet, is perfectly true of the strict followers of Pythagoras and of the Essenes.

§ 798. Josephus, who was himself a Pharisee, and therefore, in no degree predisposed by his sectarian, religious feelings, to do more than justice to the Essenes, says, “They lived the same kind of life as do those whom the Greeks call Pythagoreans.” “Herod,” continues he, “had these Essenes in highest honor, and thought more of them than their mortal nature required.” “They offer no sacrifice, because they have more pure lustrations of their own:—their course of life is better than that of other men, and they entirely addict themselves to husbandry. It also deserves our admiration, how much they exceed all other men that addict themselves to virtue, and this, in righteousness;—and indeed to such a degree, that, as it hath never appeared among any other men, neither Greeks nor Barbarians—no, not for a little time,—so hath it endured a long while among them. They are long lived also, insomuch that many of them live above a hundred years, by means of the simplicity of their diet, and the regular course of their lives.”

§ 799. The religious sect or society of our own times, denominated Quakers or Friends, was founded by George Fox, about the middle of the seventeenth century; on principles of the greatest simplicity, as well in regard to diet, dress and manners as religion;—and for several generations, the true followers of George Fox strictly and religiously adhered in practice to all the principles which he laid down. Not only were they exceedingly simple, unostentatious and spiritual in their religion,—and strictly honest and virtuous and pure in their morality,—and mild and gentle and unobtrusive and humble in their manners,—and given to hospitality and kindness, and general philanthropy,—and extremely plain and simple in their dress and speech,—but they were also exceedingly plain and simple and abstemious in their diet. The consequence was that, in the course of three or four generations, the physiological effects, in relation to health and longevity, became too manifest and too remarkable to escape general observation. It must however, be remembered that the dietetic habits of this society, being adopted purely from religious considerations, were therefore, not regulated in their simplicity, with reference to physiological principles. (§ 778.) Yet such is the importance of simplicity and temperance in diet, to the physiological welfare of the human body, that the benefits of them are strikingly manifested, even when they are not in all respects perfectly consistent with true physiological principles.

§ 800. The following article concerning the relative length of life among the Friends or Quakers, and other portions of society in civic life, appeared, a considerable time since, in the London Medical Intelligencer, and relates to a period many years past; and it is with deep regret that I find myself compelled to add, that it relates

to a state of things, whieh has also, in a great measure past away. Every true philanthropist must grieve to see so signal and so beautiful an exemplification of the virtue of temperance in all things, fade away before the luxuries whieh have already too nearly assimilated the society of Friends to the world of sensuality and excess around them.

a. "It appears from the Register of the Society of Friends or Quakers, as a consequence of their temperance;—that one half of those that are born in that society, live to the age of forty-seven years: whereas, says Dr. Prieer, of the general population of London, one half live only two years and nine months. Among the Quakers—one in ten arrives at seventy years of age,—of the general population of London, only one in forty reaches this period of life."

b. In another artiele from the Derbyshire Courier, without date, it is stated that the "Society of Friends have recently been engaged in statistieal inquiries, which tend to demonstrate that longevity in their seet, is the result of their regular habits and temperance. As a proof, it is stated, that in Chesterfield church-yard the aggregate age of the last hundred individuals buried to the date of 16th of November, (year not given) was two thousand five hundred and sixteen years and six months; while the aggregate of the last hundred Quakers, amounted to four thousand seven hundred and ninety years and seven months; giving an average of the duration of life, of the former, of only twenty-five years and two months; and of the latter or Quakers, of forty-seven years and ten months."

c. Another article, taken from the fifty-fourth number of the Christian Disciple, a paper of our own country, dated October, 1817, states that the Rhode Island Month-

ly Meeting of Friends, comprises about four hundred persons, the number of deaths in the last five years is about thirty one, and in that period, not one person has died of that Society, under forty-eight years of age.—The ages of the thirty-one persons who have died within the past five years, averaged seventy-four years.

d. In 1812, eight persons died, the youngest of whom was sixty years old,—the eldest eighty-four: of this last age there were two.

e. In 1813, also, eight persons died;—the youngest was forty-nine—the oldest eighty-five.

f. In 1814, but one died;—and that one was eighty-seven years old.

g. In 1815, five persons died;—the youngest was forty-eight;—the oldest was ninety.

h. In 1816, nine persons died;—the youngest was fifty-seven years old, and the oldest was ninety-four.

§ 801. These facts in relation to the Society of Friends, are certainly of very great importance, and ought, not only, to admonish that respectable Society of their solemn duty, both for their own sakes as individuals and as a society, and for the sake of the common cause of philanthropy, to adhere closely to those principles and practices of their Founder, which have wrought out for them such signal benefits, and guard most cautiously and rigorously against those treacherous inroads of sensuality, among them, which will completely destroy all these benefits; but they ought also, to admonish the whole civilized world of the truth and value of those physiological principles, which require plainness and simplicity and temperance in human diet.

§ 802. I might add many similar illustrations of the principles which I have advanced, from the history of

other sects and particular neighborhoods of our own country, but I deem it unnecessary.

§ 803. "According to the last census of the United States, the free white male population of the state of North Carolina, numbers 235,954,—the female,—236,889.—Total free white population, 472,843.—Of these, 202 only were foreigners not naturalized.—Of this whole number of free white people, there are fifty-eight over a hundred years old.—Of slaves, the whole number of both sexes is 245,601, and of free people of color, 19,543:—making of colored persons—slaves and free, 265,144.—Of this whole number of the colored population, 247 are over a hundred years old.—Massachusetts, with a population of 603,359 free white persons, has only five over a hundred years old. Whilst out of 7,645 free persons of color in Massachusetts, there are fifty over a hundred years of age.—There is therefore, of the white population of Massachusetts, one in 120,671 1-2 over a hundred years old.—Of the white population of North Carolina there is, over a hundred years old, one in 8,152.—Of the colored population of North Carolina there is, over a hundred years old, one in 1,073.—Of the colored population of Massachusetts there is, over a hundred years old, one in 152 3-4."

§ 804. How shall we account for this very remarkable difference, in the comparative longevity of the white and colored population of these two states?—The whites over a hundred years old in North Carolina, are, in proportion to those of Massachusetts, nearly fifteen to one.—The colored people over a hundred years old in North Carolina, are in proportion to those of the whites of the same state, nearly eight to one,—and in proportion to those of the whites of Massachusetts more than 562 to one! While the colored people over a hundred years

old in Massachusetts, are, in proportion to those of the colored people in North Carolina, seven to one; and in proportion to those of the white people in North Carolina, 53 to one; and in proportion to those of the white people in Massachusetts, about 3,950 to one. Now then, why is the proportion of white *centenarians* in North Carolina so much greater than in Massachusetts? and why is the proportion of colored *centenarians* in North Carolina so much greater than that of the whites of the same state?—and why is the proportion of colored *centenarians* in Massachusetts so much greater than in North Carolina?

§ 805. It is evident from these facts, as well as from every other just consideration, that the climate of Massachusetts is more favorable to human longevity than that of North Carolina.—The white people of North Carolina, as a general fact, do not labor near so hard as the whites of Massachusetts, and they are far more simple and less given to excess in their *food*. The severe labor of the whites in Massachusetts, in itself considered, is in some measure unfavorable to long life. Their active employment, together with their healthful and invigorating climate, exceedingly increases their appetite for food, and their tables are always furnished, not only with great abundance, but generally with considerable variety; and too frequently, this variety is very great, and comprises many dishes of compound, concentrated substances:—and flesh-meat is almost universally found upon their tables three times a day.—With such temptations before them, and with a keen appetite, and without thinking of the danger of excess, the white people of Massachusetts, as a body, generally eat, at least, double the quantity of food, that the vital economy of their bodies requires, and that food is seldom of a plain and simple kind. They

rise from their tables with overloaded stomachs, and go almost immediately to hard labor, or business which requires severe mental exercise, and thus, in either case, much increase the embarrassment of the stomach. It is probably true that, the white population of Massachusetts and of New England generally, are, as a body, without being conscious of it, the most gluttonous people in the world! Not that they are naturally more gluttonously disposed than others, but all their circumstances and habits, and the unmeasured abundance with which their industry and enterprise are crowned, concur to make them so. It is a common thing for farmers in New England, of the most athletic frames and vigorous constitutions, to complain of being worn out by hard labor before they are fifty years old: yet were they, from their youth up, compelled to live on half the food which they consume, and that food much plainer and more simple, they would complain less of the effects of hard labor and of the infirmities of age, at eighty years, than they now do at fifty.

§ 806. The dietetic and other habits of the colored people of North Carolina, come much nearer to physiological propriety, than those of the whites of the same State. Hence their much greater proportion of longevity.—The dietetic habits of the colored people of Massachusetts, are, all things considered, nearly as physiologically correct, and perhaps quite as much so, as those of the colored people of North Carolina,—but in all other respects their habits and circumstances are much more favorable to long life.—Their climate is healthier; they are less exposed to the action of foreign morbid causes,—they are free from the depressing effects of slavery, and are every way more comfortable, as a general fact—and much more intelligent. (§ 774.) It must also be

remembered that the colored people, in both Massachusetts and North Carolina, have much more constitutional stamina than the whites. They are much less tainted with hereditary predispositions and influences.

§ 807. Let it be continually kept in mind however, that in all these cases,* with whatever correctness of habit and circumstances there may be, there is still, in many respects, so wide a departure from physiological rectitude (§ 774.) that the facts which they afford are greatly modified. Yet with all this detriment, (§ 778.) it is nevertheless irrefragably true that the traditions and history of every nation and tribe of men on the face of the whole earth,—both continents and islands,—in all periods of time, when accurately understood, concur to demonstrate this general law of the human species; that, all other things being right, whether man subsists on vegetable or animal food, the more perfectly his diet is adapted in simplicity, plainness and naturalness (§ 775.) to the constitutional laws of his nature, the more perfectly all the interests of that nature are sustained. (§ 768.)

* From § 779. to § 806.

LECTURE XIV.

The natural dietetic character of man, what?—The foundation of popular opinion on the subject—Opinion of Buffon—True statement of the question—It is a question of Comparative Anatomy and Physiology—How the criteria of Comparative Anatomy are ascertained and established—Correct mode of inductive reasoning in Comparative Anatomy—Correct practical application of general principles—The teeth of man compared with the teeth of other animals as to number and arrangement—The masticatory organs of man particularly compared with those of carnivorous and herbivorous animals—The digestive organs of man compared with those of carnivorous and herbivorous animals—The masticatory and digestive organs of man compared with those of omnivorous animals—The masticatory and digestive organs of man compared with those of frugivorous animals—The physiological capabilities of man in regard to omnivorous habits compared with those of other animals—Testimony of Linnæus, Cuvier, Lawrence, Bell and others—How far the character of the gastric juice determines the natural dietetic character of an animal—The versatility of the physiological powers of the human stomach, common to other animals—Natural simplicity best for all—False reasoning of naturalists—How far reason is paramount to instinct—Does reason make man naturally omnivorous?—General conclusion from the evidence of Comparative Anatomy—How far climate determines the dietetic character of man—How far instinct leads man to be omnivorous—Early propensities of children—Infants taught to smoke in India—Instinct, how far a primary and true law of action in man and other animals—Why the average longevity of man has been nearly the same in all climates and circumstances and with all varieties of dietetic habits—Man always goes as far in indulgence as he can without sudden destruction, and what he has to his advantage in one point he sacrifices in another—Hence, universal sensuality—The principles stated by which true physiological evidence is ascertained—The assertion of Buffon and popular opinion in regard to the necessity for animal food

to nourish and sustain the human body—Proportions of nutritious matter in vegetable and animal food—General history of the human species with regard to the use of animal food—The physiological effects of flesh-meat on the human body—Physiological difference between animal and vegetable food in sustaining the body in labor—Illustrations, the Russian, Greek and other laboring men—Patagonians and other flesh-eating tribes—General conclusions from the anatomical and physiological evidence thus far examined.

§ 808. HAVING explained and illustrated the constitutional laws of relation between the alimentary organs and special senses of the human body and those foreign or external substances, designed by the Creator for the food of man; (§ 693.—767.) and having extensively exemplified the doctrines laid down by the general experience of mankind (§ 779.—807.) so far as the importance of a plain, simple and natural diet is concerned, (§ 775.) we are now prepared to inquire,

What is the Natural Dietetic Character of Man?

§ 809. The prevailing opinion on this subject, in our country and in many parts of Europe, is that, man is naturally an **OMNIVOROUS** animal:—that the highest and most permanent good of his nature requires that he should subsist on a mixed diet of vegetable and animal substances.

§ 810. Custom is the only authority for this opinion with the mass of those who entertain it. But many naturalists and physiologists have endeavored to support it by what they have supposed to be the indications of man's alimentary organs. It is an important truth however, that naturalists and physiologists, even when they claim to be strictly governed by the principles of inductive reasoning, are not unfrequently as erroneous in their apprehension and interpretation of facts (§ 39.) and as

absurd in their conclusions as the unscientific multitude, who are governed entirely by tradition, custom, habit and feeling.

§ 811. Buffon, whose writings have certainly as just a claim to poetry as to sound science, thus expresses himself on this subject:—"If man were obliged to abstain totally from flesh, he would not—at least in our climates—either exist or multiply. An entire abstinence from flesh can have no effect but to enfeeble nature. To preserve himself in proper plight, man requires not only the use of this solid nourishment, but even to vary it. To obtain complete vigor, he must choose that species of food which is most agreeable to his constitution: and as he cannot preserve himself in a state of activity but by procuring new sensations, he must give his senses their full stretch, and eat a variety of meats, to prevent the disgust arising from a uniformity of nourishment."

§ 812. Nothing can well be more egregiously whimsical and fallacious than this whole tissue of assertion and reasoning, of the celebrated naturalist:—nor is it surprising that a mind thus fanciful in its speculations—or rather thus blinded by custom and personal feelings, should find support for its hypothesis in the structure of the teeth and digestive organs. But it is truly amazing that so many scientific men, who profess to think and to investigate for themselves, should so tamely embrace and repeat notions so utterly erroneous and absurd.

§ 813. Let it be distinctly understood; the question is not whether man is capable of subsisting on a very great variety of both vegetable and animal substances,—for we have seen .(§ 694. *et seq.*) that he does possess the constitutional capability of deriving nourishment from almost every thing in the vegetable and animal kingdoms:—but the question is;—do the highest interests of the

human constitution indispensably require that man should, as a general rule, subsist on both vegetable and animal food?—It is not whether he *can*, but whether he *must* subsist on such a mixed diet in order to secure the highest and best good of which his nature is capable.

§ 814. Some have considered this wholly an anatomical question, and have asserted that, the structure and conformation of the teeth and digestive organs, constitute the only evidence in the case, by which the truth is to be ascertained. But while I admit that the anatomical evidence is very full and conclusive, I must also contend that the physiological evidence is, if possible, even more powerful and determinate: and therefore I shall proceed to examine,—**FIRST**, the **ANATOMICAL**, and **SECOND**, the **PHYSIOLOGICAL** evidence in relation to the natural dietetic character of man.

§ 815. As an anatomical question it is purely one of comparative anatomy:—that is,—the evidence must be obtained by comparing the alimentary organs of man with those of other animals whose natural dietetic character is well known:—and, therefore, that the true nature and force of the evidence may be understood, it is necessary that we should know precisely the mode in which the criteria of reasoning on the question, have been established.

§ 816. These criteria are not self-evident or manifest principles in nature; nor have they been ascertained by *a priori* reasoning, or by reasoning from causes to effects;—but by *a posteriori* reasoning—or reasoning from known effects back to principles.

§ 817. Naturalists did not, in total ignorance of the dietetic habits of animals, go out into the fields and forests and catch or slay individuals of the different species of animals in a state of nature, and examine their organs

and classify them as to their dietetic character, according to their organization, purely from such an anatomical inspection, without first studying the natural dietetic habits and natural history of the animals which they classified.—Or in other words, naturalists did not first ascertain that the lion, tiger, and other animals of like alimentary organs are carnivorous, from the structure and conformation of their organs. But, long before any zoological classification of these animals was attempted, they were well known to be beasts of prey—to subsist naturally on the flesh of other animals: or if their natural dietetic character was not known, it was first ascertained by carefully observing their natural dietetic habits; and with this knowledge naturalists proceeded to examine their organization; and found that the teeth and certain other organs, in all flesh-eating animals, are, in certain particulars, alike; and thus they inductively arrived at the general conclusion, or rule of reasoning in comparative anatomy, that all animals having alimentary organs of a certain description, are naturally carnivorous. In the same manner, they first learned the natural dietetic character of the ox and other herbivorous animals, from their natural dietetic habits, and then proceeded to examine their organization, and found that to a certain extent, all animals which were known to be herbivorous are alike in their alimentary organs; and thus again, they arrived at the general conclusion, or rule of reasoning in comparative anatomy, that all animals having alimentary organs of a certain description, are herbivorous animals. In this purely inductive manner the grand criteria or principles of reasoning on the subject before us, have been established:—so that, now it is deemed no longer necessary to study the natural dietetic habits of an animal in order to know its natural dietetic character. It is suffi-

cient for all the purposes of zoological science, to examine its organization. If it is found to possess alimentary organs like the lion, tiger and other carnivorous animals whose natural dietetic character is known, it is unhesitatingly and correctly called a carnivorous animal; or if it is found to possess alimentary organs like the ox, deer, sheep and other herbivorous animals, it is called an herbivorous animal.

§ 818. In this manner, when the bones of animals of an extinct or unknown species, are found in caves or deeply imbedded in the earth, scientific naturalists readily ascertain the natural dietetic character of those animals, by these established criteria in comparative anatomy,—especially if any of the teeth or bones of the feet be found.

§ 819. Let it be clearly understood then, that we do not, in the first place, ascertain that all animals with a certain kind of organs are carnivorous,—and all animals with a certain other kind of organs are herbivorous, &c.; but we first ascertain that all carnivorous animals have a certain kind of alimentary organs, and that all herbivorous animals have a certain other kind of alimentary organs; and then, we assert the converse of these propositions, viz: that all animals of certain organization are carnivorous and that all animals of a certain other kind of organization are herbivorous, &c.; and these last general propositions are thus established as the general principles of reasoning, or grand criteria in comparative anatomy, by which we are to ascertain the classification and natural dietetic character of all animals whose natural history is unknown. Or in other words, we do not first learn the natural dietetic character of animals from their teeth and others organs, but we first learn the dietetic character of their teeth and other organs from their natural dietetic

habits. For if we were totally ignorant of the dietetic habits of all animals, it would not be possible for us, by the most careful examination of their alimentary organs, to ascertain their natural dietetic character, with any degree of certainty. But when we have first studied the natural habits and then the anatomy of animals, and thus ascertained the correspondence between their natural dietetic habits and their peculiar organization, so as to be able to establish general principles, or scientific criteria, we then think we can clearly perceive the constitutional adaptation of their alimentary organs to their natural food:—we then believe that, we can plainly see that, the organs of carnivorous animals are manifestly fitted to seize and tear and cut the flesh on which those animals subsist; and that, we can as plainly discern that, the organs of herbivorous animals are fitted to crop and grind the grass and other vegetable substances which constitute the natural food of such animals.

§ 820. With this full explanation of scientific principles or criteria of comparative anatomy in regard to the question before us, and the manner in which those criteria are established, we shall now be able to understand the true character and force of all evidence relative to the subject under consideration.

§ 821. If the alimentary organs of an animal of an extinct or unknown species, whose natural history is entirely unknown to us, be presented for our examination, and we find that they are like those of the lion, tiger, &c., we say that they are the organs of a carnivorous animal:—and the true elements of our reasoning in the case, are these:—these organs are like the alimentary organs of the lion, tiger, &c.;—but the lion, tiger and all other animals thus organized, whose natural history is known, are naturally carnivorous animals;—therefore, these are the ali-

mentary organs of a carnivorous animal.—If on the other hand, we find that the organs are like those of the horse, ox, deer, sheep, &c., we unhesitatingly say that, they are the organs of an herbivorous animal; and the true elements of our reasoning in the case, would be precisely the same as in the case just stated.

§ 822. But suppose that, on a careful examination, we find that the organs which are the subject of our inquiry, are neither like those of carnivorous nor like those of herbivorous animals; but in some respects resembling each of them and in some respects differing from both of them?—In such a case, can we, according to correct principles of reasoning in comparative anatomy, (§ 817.) legitimately come to the conclusion that the animal to which the organs in our hand belonged, was organized to subsist on both vegetable and animal food, as his natural and most appropriate diet?—Most certainly not! No man ought to make any pretensions to scientific logic, who could reason thus! For it would be to disregard entirely the true elements of reasoning, (§ 819.) essential to the nature of the subject, and to lose sight of all established principles in the science of comparative anatomy, which relate to the question before us!

§ 823. How then, do the true principles of reasoning in comparative anatomy, require that we should proceed in such a case?—If we find on careful and accurate examination, that the organs under our inspection, are neither like those of carnivorous, nor like those of herbivorous animals, we are to conclude that the animal whose they were, belonged to neither of these orders; and if the animal belonged to an extinct or unknown species, the natural history of which is also wholly unknown, and cannot now be studied; all correct principles in comparative anatomy, most clearly and decidedly demand that we should dili-

gently explore the animal kingdom, and, if possible, find some type with which the organs under our examination correspond. But if no exact type of our specimen can be found, then we must ascertain what order of animals have alimentary organs most nearly resembling our specimen, and when this is done, we must conclude that the animal to which our specimen belonged, came nearer to that order than to any other known order of animals, in its natural dietetic character; and in all that our specimen varies from that order, and approaches to a resemblance of some other known order, we are to conclude that the animal to which our specimen belonged, differed from the former, and approached to an agreement with the latter, in its natural dietetic character. But if we find an order, with the alimentary organs of which, our specimen fully corresponds, then we are irresistibly led to the conclusion that the animal to which our specimen belonged, was of the same dietetic character with that order;—and if now, we can, by studying the natural history—or observing the natural dietetic habits of that order, fully ascertain the natural dietetic character of the animals belonging to it, then we know the natural dietetic character of the animal to which our specimen belonged, (§ 821.) just so far as the most rigorously correct principles and reasonings of comparative anatomy can teach us.

§ 824. Now then, with the strictest application of these principles, and this mode of reasoning, to the question before us; What is the natural dietetic character of man, according to the real and true evidence of comparative anatomy?

§ 825. In considering this question, it is important that we should remember that, whatever may be true concerning the natural dietetic character of man, there is neither now on earth, nor has there been for many cen-

turies, any portion of the human race, so far as we know, which have lived in all respects so perfectly in a state of nature, (§ 774.) or in a state to which the constitutional nature of man is most perfectly adapted, as to afford us an opportunity to study the true natural history of man, and learn his natural dietetic character from his natural dietetic habits; (§ 817.) and therefore, so far as this question is anatomically considered, man must in strict propriety be regarded as an extinct species;—because though man is actually a living species of animals, yet the species, as a whole, have become so artificial in their dietetic habits, that it is impossible to derive from those habits, any evidence which can justly be considered unquestionable, in relation to the natural dietetic character of man: and consequently, our evidence and reasoning in the case must be precisely such as would be proper, if man were really an extinct species and his natural history wholly unknown. (§ 823.)

§ 826. Let us suppose then, that the alimentary organs of the human body, are placed before us for our examination, in order to ascertain the natural dietetic character of man.—In the first place, those organs speak no distinct and unequivocal language—afford no clear and determinate indications, from which, without reference to any thing else, we can learn the natural dietetic character of man. (§ 819.)—In the second place, the purely natural dietetic habits of man are wholly unknown, (§ 825.) except as a matter of extremely ancient history and tradition; (§ 780.) and we have now no way by which we can become acquainted with those habits, from observation. From the nature and circumstances of the case therefore, we are under the necessity of drawing our evidence from comparative anatomy in the same manner as we would if the species were extinct and unknown. That

is, we have no other way of ascertaining the natural dietetic character of man from his alimentary organs, than by comparing those organs with the alimentary organs of other animals in a pure state of nature: (§ 821.) and if we can find an order of animals whose alimentary organs perfectly correspond with those of man, and can accurately and fully ascertain the natural dietetic habits and character of that order of animals, then have we learned, so far as we can learn from comparative anatomy, the true, natural dietetic character of man. (§ 823.)

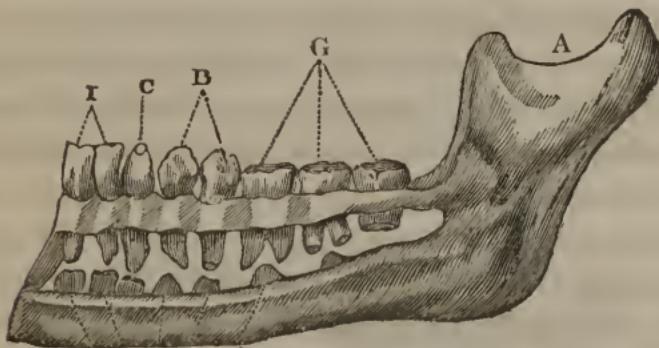
§ 827. In the human head, as we have seen, (§ 326.) there are thirty-two teeth:—eight incisors, four cuspids or eye teeth, eight bicuspids or small cheek teeth, and twelve molars or large cheek teeth: and the teeth of each jaw, in a perfectly normal state, form an uninterrupted series, in close juxtaposition, and all of nearly equal length. (Fig. 23.) In this particular, man differs from all other animals. For even in the species nearest to man, there is a considerable space between the front and the corner teeth; (fig. 59.) while in many other species, both of carnivorous and of herbivorous animals, the space is still greater, both between the incisors and the cuspids and between these latter and the cheek teeth. (Figs. 56. 57.) Carnivorous animals have in each jaw, six incisors or front teeth, two cuspids, and from eight to twelve cheek teeth. Gnawing animals, such as the rat, the beaver, the squirrel, &c., have two incisors in each jaw, no cuspids, and from six to ten cheek teeth. Ruminating animals without horns, as the camel, dromedary, &c., have two upper and six lower incisors, from two to four cuspids, and from ten to twelve cheek teeth in each jaw. Ruminating animals with horns, such as the ox, sheep, &c., have no upper incisors, eight lower incisors, no cuspids,—except in the stag,

which has them in the upper jaw,—and twelve cheek teeth in each jaw.—Animals with undivided hoofs, such as the horse, have six incisors in each jaw, two cuspids in the upper jaw, none in the lower jaw, and twelve cheek teeth in each.

§ 828. The body of the human tooth above the gum, we have seen, (§ 327.) consists of dense bone, which is every where covered on its external surface, with a plate of enamel. In this respect, man resembles both carnivorous and frugivorous animals, and differs from the purely herbivorous, whose teeth are composed of intermixed layers of bone and enamel.

§ 829. The incisors or front teeth of the human head, are broad, flat, chisel-shaped teeth (fig. 55. I)

Fig. 55.



The under jaw and teeth of man,

designed to cut the substances on which man feeds, into convenient masses for the action of the cheek teeth. (§ 326. Fig. 21. Nos. 1. 2.) The front teeth of carnivorous animals are more rounded and pointed and stand farther apart, (fig. 56.) and bear no resemblance to those of man. The incisors or front teeth of herbivorous animals, are broad like those of the human head; (fig. 53.) but they are in general much stronger, and the cutting

ends are considerably thicker and more blunt; and in some species, they vary almost as widely from those of man, as the front teeth of carnivorous animals do.

Fig. 56.



The masticatory organs of a panther.

§ 830. The corner or eye teeth in the human head, technically called the *cuspidati* or *cuspids*, (fig. 55. C) are usually of the same length of crown, as the front teeth, (§ 326.) and stand close to them. They approach more to a point than the front teeth; (fig. 21. No. 3.) but their

Fig. 57.



The masticatory organs of a camel.

peculiar shape indicates nothing more than that they constitute the first step of transition, from the chisel-shaped, cutting teeth in front, to the large square grinding

teeth in the back part of the jaws.—The cuspids or tusks of carnivorous animals, are round and pointed and much longer and stronger than the front teeth; and are separated by a considerable space both from the front and cheek teeth. (fig. 56.) In some species, these teeth are very long, acuminate and powerful; and are obviously fitted to serve as weapons of offence and defence: and may be used also to seize, hold and tear the prey.—Some of the herbivorous animals, such as the horse, the camel and the stag, (§ 827.) have the cuspids, and they are proportionally longer, and more pointed and powerful than the corner teeth of the human head, and are separated from the other teeth by a large space. In the camel (fig. 57.) the cuspids bear a strong resemblance to those of pre-daceous animals, (fig. 56.) and appear to be designed for weapons of offence and defence.

§ 831. Between the cuspids of carnivorous animals and the corner teeth of the human head there is not the slightest resemblance!—not even enough for sober fancy to build an analogy upon!—and yet, the *assumed* resemblance of the eye teeth of man to the cuspids of carnivorous animals has been the principal evidence urged to prove the natural flesh-eating character of man. But if it were true that this assumed resemblance had some reality, the argument founded upon it to prove man to be naturally in some measure a flesh-eating animal, would equally prove that the horse and the camel and other species of herbivorous animals naturally require a still larger proportion of flesh-meat in their diet. (§ 830.) According to this evidence, the camel of the desert is naturally as carnivorous as the dog. (Fig. 57.) But the assumed resemblance between the eye teeth of man and the cuspids of carnivorous animals has no reality, and therefore all the reasoning founded upon it, relative

to the natural dietetic character of man, is utterly fallacious and destitute of any true ground of support. And this is so incontrovertibly, so palpably correct, that it does not seem possible that scientific gentlemen who have repeated the whimsical speculation concerning the *canine* teeth of man, could ever seriously have examined the subject, or for one moment actually compared the eye teeth of man with the cuspids of a common house-cat.

§ 832. The bicuspids, or small cheek teeth of man, (fig. 55. B) have two prominences, or obtuse points (§ 326.)—the one on the outer, and the other on the inner side of the mashing or grinding end:—the outer one being generally somewhat more prominent than the inner. (Fig. 21. Nos. 4. 5.) The molars, or large cheek, or double teeth in man, (fig. 55. G) have large, and nearly square crowns; (fig. 21. Nos. 6. 7. 8.) presenting broad, mashing and grinding surfaces, with the corners slightly elevated, so as to form on each tooth, four or five very blunt prominences, (§ 326.) thus increasing the grinding and triturating power of the teeth. The bicuspids, or small cheek teeth of carnivorous animals, have two or three sharp points somewhat resembling saw-teeth, (fig. 56.) and these points are not situated side by side, or parallel with each other, like the blunt tubercles of the human bicuspids; but they are placed one before the other, like the teeth of a saw, and appear to be fitted wholly for cutting and tearing. The large cheek, or double teeth of carnivorous animals (fig. 56.) also rise into very high and sharp points like those just described, only they are much larger and more prominent—the middle point of each tooth rising above the others, like a spear. These teeth present nothing which approaches to a grinding or triturating surface; but like the small cheek teeth, they are fitted for tearing and cutting, and cannot

admit of the grinding or lateral motion.—The molar, or cheek teeth of herbivorous animals, have very large, square, or oblong-square crowns,—not however proportionally larger than those of man, (fig. 57.) but their construction is entirely different. (§ 828.) They are composed of alternate, longitudinal plates of bone and enamel, and the whole crown is surrounded on its sides with a plate of enamel like human teeth: but the grinding surface is not covered by enamel like human teeth, but presents the uncovered ends of the alternate, longitudinal plates of bone and enamel:—and the plates of bone being much softer than those of enamel, wear away much faster in mastication, and thus the plates of enamel are caused continually to be more prominent than those of bone; and thereby a roughness is given to the grinding surface which greatly increases its dividing and triturating power, upon the grass, twigs, boughs and other vegetable and woody substances on which herbivorous animals naturally subsist.—In some species, the grinding surface is nearly flat:—in others, the corners of the crown are considerably more elevated than the centre.

§ 833. The cheek teeth in the lower jaw of man, shut against those of the upper jaw (fig. 23.) so as to bring the grinding surfaces of the two series together, in opposition to each other, and thus mash and grind the substances which come between them in the act of mastication. In this respect man resembles herbivorous and frugivorous animals. But the cheek teeth in the lower jaw of carnivorous animals, shut within those of the upper jaw: so that, if we take a pair of shears and file the two cutting edges into teeth like a saw, and then cut with them, we shall get a very good idea of the appearance and operation of the cheek teeth of carnivorous animals in the upper and lower jaw. The manner in which these

teeth shut together fits them still further for cutting the flesh on which the animals feed, into small masses preparatory for swallowing, and at the same time still further precludes all lateral or grinding motion in the act of mastication.

§ 834. In herbivorous animals, the articulation or joint of the lower jaw is such as to admit of very free lateral motion in the act of mastication; as we see in the cow, and other ruminating animals, when chewing the cud.—In man also, the articulation of the under jaw (fig. 55. A) admits of very considerable lateral motion of the jaw in the act of mastication, (§ 323.) so that the grinding surfaces of the cheek teeth of the upper and lower jaws, can move upon each other from right to left and from left to right, and thus completely triturate or grind the food into very minute particles before it is swallowed. (§ 426.) But in carnivorous animals, all lateral motion of the lower jaw in the act of mastication, is not only precluded by the structure of the teeth (§ 832.) and the shutting of the lower cheek teeth within those of the upper, (§ 833.) but it is rendered impossible by the articulation of the lower jaw, which only admits of the backwards and forwards motion.—In all these animals, the muscles by which the motions of the lower jaw are effected, correspond with the articulation. In carnivorous animals, the muscles by which the lower jaw is raised up and the teeth shut together in the act of cutting or tearing the food, are very large and powerful; but those muscles which correspond with those in herbivorous animals by which the lateral motion is effected, are exceedingly small; while in herbivorous animals the muscles of lateral motion are largely developed, and those by which the under jaw is raised up are comparatively much smaller than in carnivorous animals. In this respect

again, as in the articulation of the under jaw, man closely resembles herbivorous animals, and differs entirely from the carnivorous.

§ 835. Such is a faithful and true comparison of the masticatory organs of man, with those of carnivorous and herbivorous animals: and every one who will take the trouble to examine these organs in a house-cat, in a horse or cow and in the human head, and compare them together, will find a complete demonstration of what I have stated.—We see therefore, that there is no resemblance between the masticatory organs of man and those of carnivorous animals. The latter are fitted to seize and hold the struggling prey, to tear the tenacious flesh from the bones and to cut it into masses small enough to be swallowed; and being thus swallowed in raw masses into stomachs formed to receive it in such a condition, it passes less rapidly through the gastric cavity, and consequently sustains the animal a longer time, and causes a less hasty return of hunger, than if the flesh were finely comminuted or ground by the teeth. But the masticatory organs of man are fitted to cut the food into masses suitable to the capacity and operations of the mouth and to grind those masses into fine particles, and thoroughly mix them with the saliva; and thus bring the food into precisely that condition which best fits it for the human stomach. (§ 727.)

§ 836. Nothing is more incontrovertibly true than that, so far as the masticatory organs are considered, comparative anatomy does not afford the slightest evidence that man is in any measure a carnivorous animal: and I am bold to affirm that, such an idea never was drawn from any actually perceived resemblance between the masticatory organs of man and those of carnivorous animals: but it was derived entirely and exclusively from the diete-

tic *habits* of man: and being thus derived, it gave birth to the creative fancy which imagined and announced the resemblance, and this imagined resemblance has been confidently relied on by thousands, because they did not care to take the trouble to examine for themselves.

§ 837. Between the masticatory organs of man and those of purely herbivorous animals, there is some resemblance; and in some respects that resemblance is strong: but the evidence is by no means sufficient to justify the conclusion that man is naturally herbivorous. So far as the masticatory organs are considered then, comparative anatomy affords no conclusive evidence that man is naturally an herbivorous or grass-eating animal.

§ 838. The salivary glands (§ 340.) of herbivorous animals are, as a general fact, comparatively larger than those of carnivorous animals. In man these glands are not proportionally so large as in the purely herbivorous, nor so small as in carnivorous animals; but they are exceedingly copious in their secretion, and therefore in their physiological character, they approach nearer in man to those of herbivorous than to those of carnivorous animals. They are also more largely developed in those portions of the human family who have long subsisted on vegetable food, than in those which subsist mostly on animal food.

§ 839. As a general fact, herbivorous animals have a much longer alimentary canal than carnivorous animals:—but this is not invariably the case. The hyena, which subsists on the dead carcasses of animals, eating both flesh and bones, has an alimentary canal of about the same comparative length as that of the horse, which is herbivorous. The seal and porpoise, which live wholly on animal food, have an alimentary canal twenty-eight times the length of the body; and this is equal to the greatest

comparative length in herbivorous animals.—“ Many species of animals,” says Carus, in his System of Comparative Anatomy, “ which live entirely on animal food, have an extraordinary length of the alimentary canal, ranging from eleven to twenty-eight times the length of the body.” Nevertheless, it is predicated as a general law, by naturalists, that the average length of the alimentary canal is relatively much less in carnivorous, than in herbivorous animals. In those animals which subsist wholly on animal food, the length of the alimentary canal varies from one, to six or eight times the length of the body, as a general rule: but to this rule, as we have seen, there are some exceptions.—In herbivorous animals with undivided hoofs, such as the horse, the canal varies from eight to eleven times the length of the body.—In herbivorous animals that divide the hoof and chew the cud, such as the ox, deer, sheep, &c., the canal varies from eleven to twenty-eight times the length of the body.

§ 840. In ascertaining the comparative length of the alimentary canal in all these animals, naturalists have taken the length of the body in a straight line from the snout to the posterior extremity of the back-bone, but in man, they have measured from the top of the head to the bottom of the heel: and by this manifestly erroneous admeasurement, they have unfairly reduced the comparative length of the alimentary canal about one half, and made it to appear that the comparative length of the alimentary canal in man, varies from three to eight times the length of the body: and thus they have succeeded in associating man with carnivorous animals. But if the alimentary canal in man be compared with the length of the body, in the same manner that it is in all other animals, it will be found that its average length is about ten or

twelve times the length of the body. This is evidently the true admeasurement, and it is surprising that any other should ever have been adopted, even for the sake of supporting a favorite theory:—and especially one so palpably unjust as that which has heretofore been allowed.

§ 841. Carnivorous animals, as a general rule, have a simple stomach, which is not fitted to retain the food a very long time, while herbivorous animals have either a complicated stomach, (§ 319.) or a simple one, which is formed to retain its food much longer than that of carnivorous animals. The human stomach is simple, (fig. 29.) but not more so than that of the horse, and it is manifestly formed to retain the food for a considerable time. (§ 347.)—The colon or large intestine in carnivorous animals is never cellulated, but is always cylindrical, and comparatively much smaller than in herbivorous animals. In the latter—and especially where the stomach is simple, the large intestine is very capacious; and the cœcum (§ 346.) is particularly large; and the colon, throughout its whole length, is gathered into sacs or cells by longitudinal bands. In man the cœcum is large, and the colon, as we have seen, (§ 346.) is sacculated (fig. 33.) as in herbivorous animals. Indeed, the calibre or diameter of the whole alimentary canal, is relatively much greater in man than in carnivorous animals: and moreover, the numerous semilunar folds (§ 346.) in the mucous membrane of the small intestines of man (fig. 32.) very considerably increase the longitudinal extent of surface in the human alimentary canal.

§ 842. We see then, that in regard to the true comparative length, the capacity and the conformation of the alimentary canal, comparative anatomy affords not the slightest evidence that man is naturally, in any measure, a carnivorous animal: and although in most respects,

man very strongly resembles many of the species of herbivorous animals, yet, taking the masticating and digestive organs together, the evidence does not appear to be sufficiently complete and determinate to warrant the conclusion, that man is naturally an herbivorous animal. If, however, we were obliged to class man either with carnivorous or herbivorous animals from the evidence of his alimentary organs, we should be compelled, by all correct principles in the science of comparative anatomy, to place him with the latter. But before we are driven to this necessity, it must be ascertained that in the whole animal kingdom, there is no other order of animals besides the pure herbivora and carnivora;—or none whose alimentary organs so nearly resemble those of the human body. But this is not true:—and therefore we are bound to look still farther for alimentary organs with which we can compare those of man, before we come to a final conclusion in regard to man's natural dietetic character.

§ 843. Is it said that no one claims man to be a purely *carnivorous*, but an *omnivorous* animal, and that his organization shows him to be designed to feed on both animal and vegetable food?—Then let us ascertain whether there is any other animal in nature which is truly omnivorous, and if so, let us compare the alimentary organs of man with those of such an animal. We need not go far to find an animal of this description. Both the hog and the bear are naturally omnivorous:—that is, in a pure state of nature, when left to their natural instincts, they will eat both vegetable and animal food. It is important to remark however, that in a perfectly pure state of nature, when free to choose their aliment and with an abundance before them, they both, greatly prefer vegetable to animal substances, and neither of them, in such a state, ever

preys upon living animals, unless urged by pinching hunger. Their most natural food therefore, appears to consist of fruits, nuts, roots, grain and other products of the vegetable kingdom. Yet, strictly speaking, they are omnivorous animals, and are organized accordingly.

§ 844. Let us then compare the alimentary organs of man with those of the swine. (Fig. 58.) We perceive

Fig. 58.



The under jaw and teeth of a swine.

at a glance, that there is little resemblance between the front teeth of the hog and those of the human head, (fig. 55.) and still less, between the eye teeth of man and the tusks of the hog.—The bicuspids, or small cheek teeth of the hog, are almost exactly like those of carnivorous animals, but have not the most remote resemblance to those of the human head. The molars, or large cheek teeth of the hog, on the other hand, have no resemblance to those of carnivorous animals, but are exceedingly like those of the human head. This comparison therefore, does not in the smallest degree, show man to be naturally an omnivorous animal. The only teeth in the hog, which have any resemblance to human teeth, are the large cheek teeth, and these do not indicate a carnivorous, but a frugivorous character. The

whole force of evidence derived from the masticatory organs of the hog, therefore, goes to prove that man is in no measure, a flesh-eating animal.

§ 845. The digestive organs of the hog more strongly resemble those of man, but when these are taken in connexion with the masticatory organs, which constitute the principal anatomical index of the dietetic character,—and also, in connexion with the fact, that in a pure state of nature, the hog prefers vegetable food, and principally subsists on it; and requires no animal food for the fullest and most perfect development and sustenance of its anatomical structure and physiological powers, the whole force of evidence still goes to prove that man is not naturally, in any measure, a flesh-eating animal.

§ 846. We therefore, remain without a determinate solution to our question, and are called upon to push our investigations still further, in pursuit of more decided and conclusive evidence. And, fortunately for us, that evidence is near at hand; and just where we should expect to find it; and where we ought first to have looked for it; and where we *should* first have looked for it, if our minds had neither been sophisticated nor misled by education, custom, and depravity.—In the order next below man, we find several species of animals whose alimentary organs in all respects very nearly resemble those of the human body: and in the species which comes nearest to man in general organization and appearance, the alimentary organs in almost every particular, so nearly resemble those of the human body, that they are easily mistaken for them. And few, who are not in some measure acquainted with comparative anatomy, would be apt readily to detect the distinguishing differences. The number and order of the teeth, in the orang outang,

are the same as in man. The incisors or front teeth (fig. 59.) are precisely like those of the human head:—

Fig. 59.



The first, or infant teeth of an orang outang, considerably reduced in the drawing.

the cuspids or corner teeth are relatively longer and more pointed and are separated from the other teeth by small spaces; (§ 827.) and in all respects approach much more to the appearance of the cuspids of carnivorous animals than the corner teeth of man

do. The cheek teeth, like the incisors, so much resemble those of the human head,

that it is difficult to distinguish them. The only difference is that, the elevations on the grinding surfaces of the orang outang's teeth are somewhat more prominent and pointed. The articulation of the under jaw, the form of the stomach, the comparative length of the alimentary canal, the relative capacity of the cœcum and the cellular arrangement of the colon in the orang outang, all likewise correspond very closely with those of the human body. As a general statement however, the comparative length of the alimentary canal is somewhat greater in man than in the orang outang. Excepting then, that the cuspids are relatively longer and more pointed and separate, and the cheek teeth somewhat more trenchant, and the alimentary canal rather shorter in the orang outang than in man, the resemblance between the alimentary organs of these two species of animals is perfect.

§ 847. In the other species of monkeys the cuspids are relatively longer and more pointed, and the cheek teeth more trenchant or sharp-pointed at the corners than in the

orang outang. In the baboon the cuspids are large, long and powerful weapons of offence and defence, and in all respects resemble the corresponding teeth in purely carnivorous animals.

§ 848. In strictest accordance with the established principles in the science of comparative anatomy then, the alimentary organs of the orang outang are to be regarded as the true type (§ 823.) with which we are to compare those of the human body, in order to ascertain the natural dietetic character of man. But we have seen (§ 846.) that, in all that the organs of the orang differ from those of man, they bring the orang between man and carnivorous animals; and thus, as it were, push man still farther from a carnivorous character. (§ 823.) Yet it is well known that not only the orang outang, but all the other species of monkeys are, in a perfectly pure state of nature, when left free to choose their own nourishment and follow their undepraved instincts, wholly *frugivorous* or fruit-eating animals,—subsisting exclusively on fruits, nuts and other esculent farinaceous vegetables. And they never, in such a state of nature, feed on animal food, except in circumstances in which even the cow and the sheep become carnivorous; viz. when suffering from extreme famine, and goaded on by excessive and tormenting hunger. In such emergencies, monkeys, cows, sheep and probably most other animals will greedily devour such animal substances as fall in their way, or such as they are able to obtain.*

* The inhabitants of Nantucket used to keep many sheep and cows upon the island without making any provision for them during the winter: and I have frequently been assured by many of the intelligent people of that island, that when the ground was covered with snow, it was a common thing for the cows and sheep to come into the town, and like swine, greedily devour every animal as well as vegetable sub-

§ 849. But it is said that the orang outang, on being domesticated or brought under the care of man, readily learns to eat animal food, and soon discovers more fondness for it, and devours it more greedily than it does any kind of vegetable food; and hence, it is inferred that this animal is naturally omnivorous, and confines itself to fruits, &c. in a state of nature, only because it is unable to procure animal food in a condition adapted to its organization and alimentary wants. But this inference involves a monstrous absurdity:—for it assumes that God has constituted an animal with certain alimentary wants and endowed it with corresponding instincts, without giving it the necessary mental and voluntary powers to obey those instincts and supply those wants. Besides, if the fact that the orang outang readily learns to eat animal food, proves that animal to be naturally omnivorous, then the horse, cow, sheep, &c. are all naturally omnivorous animals: for every one of them is easily trained to eat animal food and to subsist on a mixed diet. Indeed, they readily become so accustomed to this artificial mode of living as greatly to prefer their prepared dishes of beef-steak, toast and coffee, to their own natural diet of grass or hay and water. “In Norway, as well as in some parts of Hadramant and the Coromandel coasts, the cattle are fed upon the refuse of fish, which fattens them rapidly, but seems at the same time totally to change their nature, and render them unmanageably ferocious.”* Horses have frequently been trained to eat animal food, so as to demand it with great eagerness and devour it greedily; and sheep have often been so accus-

tance they could find in the streets,—even pulling up and consuming pieces of fish-skin and other animal substances which were trodden down and frozen into the ground.

* Life of Reginald Heber, Harpers' Family Library, No. 40. p. 360.

tomed to animal food that they would wholly refuse to eat grass. By this dietetic change, the physiological condition of the digestive organs may be so affected, that if the animal be suddenly deprived of this diet and exclusively confined to its own natural and proper food and drink, it will at first droop exceedingly, and perhaps become sick, and in some instances die.

§ 850. It is also true that the lion, the tiger and other carnivorous and predaceous animals may be trained to a vegetable diet, and learn to live on vegetable food alone: and it is an interesting fact, that if the young of these animals be taken before they have ever tasted flesh, and carefully trained to a vegetable diet till they are grown up, they will discover no desire for flesh-meat.—A friend of mine took a young kitten and carefully trained it to a vegetable diet. It did well and became a fine cat, remarkable for its strength and activity. When it was fully grown, flesh was put before it, but the cat would not touch it: and although the cat was an excellent mouser, yet it was never known to devour or eat any part of its prey; but, having killed the rats and mice which it caught, it would always bring them into the kitchen and lay them down at the feet of some member of the family and there leave them. By slow degrees however, this cat was trained to eat a portion of flesh with its dinner, and after a while appeared to relish it well: yet, if flesh was offered to it in the morning or evening, it would not touch it; and this cat continued to refuse flesh-meat at all other times except at its dinner. Since this experiment, several others have been made with similar results. In one instance, after the cat was grown up, it was occasionally fed with flesh, and was invariably made sick by it.

§ 851. In this manner, all carnivorous animals, among beasts and birds, can be trained to a vegetable diet. And

it is worthy of remark that, this class of animals can be brought to subsist exclusively on vegetable food with less physiological inconvenience and greater safety to life and health, and much less deterioration of the constitution as a permanent effect, than herbivorous and frugivorous animals can be brought to live exclusively on animal food. Hence therefore, if the fact that the orang outang and other species of monkeys can be trained to subsist on a mixed diet of vegetable and animal food, proves them to be naturally omnivorous, (§ 849.) then is it equally proved that the lion, tiger, cat, eagle* and other predaceous animals; and the horse, cow, sheep and other herbivorous animals are all naturally omnivorous. But no enlightened and honest mind will for a moment admit that any of these animals are naturally omnivorous.

§ 852. It is therefore, perfectly certain that the whole evidence of comparative anatomy, when correctly apprehended and accurately estimated, goes to prove determinately that man is naturally a *frugivorous* animal. And thus it appears that the true evidence of comparative anatomy, and the ancient Mosaic record of the natural history and dietetic character of man, perfectly agree. That record explicitly asserts that in the truly natural state of man, ere he had transgressed any of the laws of his nature, he subsisted, according to Divine adaptation and appointment, wholly upon the fruits of trees and the seeds of herbs, (§ 779. 780.) or upon fruits and farinaceous vegetables.

§ 853. For more than two years, I had, in my public lectures, presented the foregoing arguments in regard to the natural dietetic character of man, before I was aware that, similar views had been published by others; as my

*The eagle has been trained to live entirely on vegetable food.

own knowledge on the subject had been derived almost entirely from actual examinations in comparative anatomy, and from the oral information of living travellers. I have since however, in the course of my general researches, most unexpectedly and agreeably fallen upon the testimony of several distinguished men, which, so far as the evidence of comparative anatomy is considered, fully corroborates my reasonings and conclusions. The sum of that testimony, I shall therefore now present;—not because I think truth is rendered the more valuable by the adjunct of even the most distinguished of human names, but because I am fully aware of the deeply humiliating fact, that mankind generally, are far more ready to bow to the authority of a name than to yield to the evidence of truth. Before an individual has gained a moral sovereignty over the minds of his race, his evidence, however incontestible, and his reasoning however irrefragable, are weighed and measured by the obscurity of his name; and he is sneered at as being contemptible in proportion as his opinions lack the authority of great names. In this state of things, integrity, research, science, philosophy, fact, truth, are no shield against the misrepresentations and ridicule and abuse which are heaped upon him. But if, by any means, he can gain a conquest over men's minds, he may sit down upon the throne, and wield the sceptre of intellectual despotism; and then his word is law, to which mankind submit with zealous alacrity; as if each were emulous to be nearest to the chariot wheels of such a despot, in his triumphal progress through the world: while few concern themselves to inquire whether that word of authority is sustained by truth or not. Nevertheless, such are the scientific attainments, and the general knowledge and integrity of some men, that their opinion on subjects to

which they have given great attention, is worthy of high consideration, and when such men are compelled by the force of irresistible evidence, to come to conclusions and acknowledge principles which do not accord with their preferences, nor correspond with their practices, the testimony merits a still higher respect.

§ 854. Linnaeus, the distinguished naturalist, who flourished about one hundred years since, speaking of the natural dietetic character of man, says that his organization when compared with that of other animals, shows that "fruits and esculent vegetables constitute his most suitable food."

§ 855. Sir Everard Home says, "While mankind remained in a state of innocence, there is every ground to believe that their only food was the produce of the vegetable kingdom."

§ 856. Baron Cuvier, who is perhaps the highest human authority on any question in comparative anatomy, says, "The natural food of man therefore, judging from his structure, appears to consist of fruits, roots and other succulent parts of vegetables:—and his hands offer him every facility for gathering them. His short and moderately strong jaws on the one hand, and his cuspidati being equal in length to the remaining teeth, and his tubercular molares on the other, would allow him neither to feed on grass nor devour flesh, were these aliments not previously prepared by cooking."

§ 857. Professor Lawrence, of England, agrees fully with Baron Cuvier, and justly observes that, "physiologists have usually represented that our species holds a middle rank in the masticatory and digestive apparatus, between carnivorous and herbivorous animals: a statement which seems rather to have been deduced from what we have learned by experience on this subject, than

to have resulted fairly from an actual comparison of man and animals."—After having accurately compared the alimentary organs of man with those of carnivorous, herbivorous and frugivorous animals, he correctly remarks that "the teeth of man have not the slightest resemblance to those of carnivorous animals, except that their enamel is confined to the external surface. (§ 828.) He possesses indeed teeth called canine, but they do not exceed the level of the others, and are obviously unsuited for the purposes which the corresponding teeth execute in carnivorous animals."—"Whether therefore, we consider the teeth and jaws or the immediate instruments of digestion, the human structure closely resembles that of the semiæ or monkeys, all of which, in their natural state, are completely frugivorous."

§ 858. Mr. Thomas Bell, lecturer on the anatomy and diseases of the teeth, at Guy's Hospital, and surgeon dentist to that institution, in his "Physiological observations on the natural food of man deduced from the character of the teeth," says,—"The opinion which I venture to give, has not been hastily formed, nor without what appeared to me sufficient grounds."—"It is not, I think, going too far to say that, every fact connected with human organization, goes to prove that man was originally formed a frugivorous animal, and therefore probably tropical, or nearly so, in his geographical situation. This opinion is principally derived from the formation of his teeth and digestive organs, as well as from the character of his skin and general structure of his limbs."—"If analogy be allowed to have any weight in the argument, it is wholly on the side of the question which I have just taken. Those animals whose teeth and digestive apparatus most nearly resemble our own, namely, the apes and monkeys, are undoubtedly frugivorous."

§ 859. With such conclusive evidence from comparative anatomy, and so full an acknowledgement from the most distinguished naturalists, anatomists and physiologists, the question in regard to the natural dietetic character of man, might reasonably be supposed to be fairly and fully settled: yet surprising as it may appear, even Baron Cuvier, after declaring that the evidence of comparative anatomy proves man to be naturally a frugivorous animal, and that his masticatory organs would allow him neither to feed on grass nor devour flesh, were these aliments not previously prepared by cooking, adds that, "man once being possessed of fire, and those arts by which he is aided in seizing animals, or killing them at a distance, every living being was rendered subservient to his nourishment;—thereby giving him the means of an infinite multiplication of his species."—And Professor Lawrence, with a full admission of the completeness of the anatomical evidence in favor of man's frugivorous character, and a frank acknowledgment that the general history of the human race, proves that animal food is not necessary to render man strong and courageous; and that vegetable food is as little connected with weakness and cowardice,—that men can be perfectly nourished and their bodily and mental capabilities fully developed, in any climate, by a diet purely vegetable, still contends that man does quite as well, and perhaps better, on a mixed diet of vegetable and animal food; and occasionally indulges in a sneer against those who favor the idea that a pure vegetable diet is best adapted to sustain the human system in all its properties and powers. In attempting to sustain this opinion however, he misapprehends many facts, perverts many others, assumes false positions, makes wrong inferences, arrives at erroneous

conclusions, and not unfrequently, contradicts himself.*

§ 860. Were it not for the well known truth, that the depraved appetites and propensities of man, continually exert such a perverting influence upon his intellectual and

* As a specimen of Mr. Lawrence's contradictory statements, take the following paragraphs selected from different pages of his work.

"That animal food renders man strong and courageous, is fully disproved by the inhabitants of northern Europe and Asia, the Laplanders, Samoïdes, Ostiacs, Tungsees, Burats and Kamtschadales, as well as by the Esquimaux in the northern, and the natives of Terra del Fuego in the southern extremity of America, which are the smallest, weakest and least brave people on the globe, although they live almost entirely upon flesh, and that often raw.

"Vegetable diet is as little connected with weakness and cowardice as that of animal matter is with physical force and courage. That men can be perfectly nourished and their bodily and mental capabilities fully developed in any climate, by a diet purely vegetable, admits of abundant proof from experience. In the periods of their greatest simplicity, manliness and bravery, the Greeks and Romans appear to have lived almost entirely on plain vegetable preparations."

"If the experience of every individual were not sufficient to convince him that the use of animal food is quite consistent with the greatest strength of body and mind, the truth of this point is proclaimed by the voice of all history. A few hundreds of Europeans hold in bondage the vegetable-eating millions of the East.—We see the carnivorous Romans winning their way from a beginning so inconsiderable that it is lost in the obscurity of fable, to the empire of the world," &c.

Here we have it first stated and proved, that flesh-eating is not conducive to strength and courage: and secondly, stated and proved that a vegetable diet does not make men weak and cowardly, but that vegetable-eaters may be brave and powerful and heroic. And in the third place, it is asserted that a few hundreds of Europeans, because they are flesh-eaters, are able to hold in bondage the millions of the East, because they are vegetable-eaters. And the Romans, who are exhibited as vegetable-eating heroes in the second paragraph, are made to figure as carnivorous conquerors in the third.—But this is quite as consistent as the reasoning of any who attempt to prove the carnivorous character of man, from anatomy, physiology or experimental fact.

moral powers, (§ 630.) as lead him, through the misapprehension of facts, and unfair estimation of evidence, and fallacious conclusions, into the most egregious errors and absurdities, for the sake of defending and supporting those favorite opinions which are founded in sensual gratification, it would be exceedingly difficult to account for the many erroneous notions and absurd speculations which have been entertained by very intelligent men in regard to the natural history of the human species.

§ 861. Since the advocates for the omnivorous character of man have found themselves compelled to acknowledge that the evidence of comparative anatomy is wholly and powerfully against them, they have mainly planted themselves on two positions. The one is the peculiar quality of the gastric secretion in man, or the solvent fluid of the human stomach, and the other is the peculiar intellectual and voluntary powers of man.

§ 862. It is said that the stomach of every animal, secretes a solvent fluid possessing precisely the properties requisite for the digestion of the natural food of the animal, and wholly inefficient on other kinds of food. Thus we are told, that "the gastric juice of carnivorous animals readily digests flesh, but will not digest vegetable substances; while on the other hand, the gastric juice of herbivorous animals readily digests grass and other vegetable substances, but will not digest flesh; and therefore the gastric secretion, or solvent fluid of the stomach, fully and unequivocally determines the natural dietetic character of the animal. But the solvent fluid of the human stomach readily digests both animal and vegetable food, therefore man is naturally an omnivorous animal."

§ 863. This position is so manifestly contrary to truth and fact that it would be unworthy of notice, had it not been advanced by men of considerable reputation in the

scientific world, and reiterated by many who have much influence on the popular mind. Yet superficial and preposterous as it is, it is eagerly embraced by those who are determined, by any means and by all means possible, to defend those habits which they regard as necessary to their highest sensual enjoyment.

§ 864. The truth is that, though every thing in nature is constituted upon fixed principles (§ 140.—144.) and with determinate relations, yet in the organic world, every constitution has a considerable range or compass of physiological capabilities:—and although every organ in every animal has its determinate physiological character and precise constitutional adaptation, (§ 697.) yet every organ possesses a physiological adaptability by which it is capable, to a certain extent, of varying from its truly natural, constitutional adaptation, and still not so far impair its functional power and results as to interrupt the general vital economy of the system, or suddenly to destroy the vital constitution. Hence, whenever the physiological habits of the system are disturbed or its particular or general condition is affected, every vital organ always endeavors to adapt itself to the requisition of circumstances: and the power and extent of adaptability in each organ, and its efforts to adapt itself to the requisition of circumstances, always correspond with the functional character and relations of the organ. This being a wise and benevolent provision of the Creator for the preservation of life, and especially with reference to the alimentary wants of living bodies, while the digestive organs are constituted and endowed with the most perfect natural adaptation to certain kinds of aliment, (§ 734.) yet, to secure life as far as possible against emergencies, these organs possess the physiological capability of adapting themselves to an extensive variety of aliment-

ary substances, as circumstances and necessities require: and therefore, the extent of the physiological adaptability of the digestive organs, is probably much greater than that of any other organs in the system.

§ 865. Possessing these physiological powers, the human stomach, if it be regularly supplied with an exclusively vegetable diet, will soon become adapted to such a diet, and secrete a solvent fluid most perfectly qualified for the digestion of it: and if the diet be suddenly changed to one of flesh-meat exclusively, the stomach will not be prepared to receive it, and will not at first be able to digest it, but it will cause vomiting and purging, and other symptoms of physiological disturbance. Yet if the flesh diet be commenced by degrees, and regularly continued, the stomach will soon become adapted to it, and secrete a solvent fluid most perfectly qualified to digest it: and if the diet be again suddenly changed to an exclusively vegetable one, similar disturbances will take place;—but if vegetable food be gradually introduced with the flesh-meat, the stomach will soon become adapted to a mixed diet and secrete a solvent fluid qualified to digest it.

§ 866. Now if this physiological adaptability were peculiar to the human stomach, it would certainly go very far towards proving that man is naturally an omnivorous animal; but when we know that it is common to the horse, ox, sheep, (§ 849.) lion, tiger, cat, dog, (§ 850.) and indeed, to all the higher classes of animals, (§ 851.) and perhaps to the whole animal kingdom, we see that it proves nothing but the wonderful resources of animated nature, and the wisdom and benevolence of God. Both carnivorous and herbivorous, as well as frugivorous animals generally, in the higher classes at least, possess this scope and versatility of digestive power, nearly or quite as extensively as man; and therefore if it proves man to be

naturally omnivorous, it equally proves the lion and the ox,—the vulture and the lamb and other animals generally, to be naturally omnivorous. For, as we have seen, (§ 849.) even the sheep may become so accustomed to a flesh diet, that it will refuse its natural food: and if it be suddenly put upon its natural food, it will, at first, be unable to digest it. (§ 865.)

§ 867. Let it be remembered however, as a very important physiological truth, that, although the stomach generally, possesses the power of adapting itself to the alimentary substances with which it is regularly supplied, and can at one time, secrete a solvent fluid best qualified to digest animal food, and at another time, secrete a solvent fluid best qualified to digest vegetable food, according to the character of the diet;—and can also be trained to secrete a solvent fluid which will digest food composed of both vegetable and animal substances, yet neither the human stomach, nor that of any other animal, is capable of secreting a solvent fluid which, at the same time, is equally well qualified to digest both vegetable and animal substances. That is, the solvent fluid of the stomach accustomed to a mixed diet of the two substances, cannot digest flesh so well as the fluid of a stomach accustomed only to a flesh diet, nor vegetable substances so well as the fluid of a stomach accustomed only to a vegetable diet. Not even the stomach of the bear nor of the hog, which are as truly omnivorous animals as any in nature, can digest both vegetable and animal substances together at the same time, so well as it can digest each of them separately and at different times.

§ 868. It is also true as a general physiological law, that where the stomach is accustomed to a mixed diet of vegetable and animal food, in proportion as animal food abounds and predominates in the diet, the power of the

stomach to digest vegetable substances is diminished. Hence, among those portions of the human family that subsist on a mixed diet, children, before they become much accustomed to flesh-meat, will eat almost every variety of fruits and vegetables, with the greatest freedom and with little sensible inconvenience; but as they advance in life, and become accustomed to a free use of flesh-meat, and gradually increase its proportion in their diet, they find themselves obliged to become more and more careful and circumscribed in their use of fruits and other vegetable substances; till, they often become unable to partake of any vegetable matter except bread and perhaps boiled rice and potatoes, or some other simple farinaceous article. Yet after all this, these very individuals, by an abandonment of flesh-meat and the adoption of a correct general regimen, may again return to their youthful enjoyment of fruits and vegetable substances generally.

§ 869. The position that man is rendered naturally omnivorous by the possession of peculiar intellectual and voluntary powers, (§ 861.) is perhaps less obviously, but not less essentially erroneous and absurd, than the one just considered. (§ 862.) Man, we are told, is endowed with **REASON**, and therefore he is not, like other animals, a mere creature of instinct; but he is capable of thinking, reflecting, and judging, and of acting from the dictates of his judgment:—and consequently, what he finds deficient in the adaptations of nature to his wants, he makes up in the rational exercise of his voluntary powers. Hence, though, “judging from his structure, (§ 856.) his *natural food appears to consist of fruits, roots, and other esculent parts of vegetables*,—though neither the length nor the strength of his jaws fit him for subsisting on herbs, nor the character of his teeth for devouring flesh, were

these aliments not previously prepared by cooking, yet being able, by the exercise of his rational and voluntary powers, to catch and kill animals, and to cook his food with fire, every living being is rendered subservient to his nourishment,—thereby giving him the means of an infinite multiplication of his species."

§ 870. If the meaning of this language were simply a predication of the physiological capability of man to adapt himself to a mixed diet of vegetable and animal food, or to derive nourishment from almost every vegetable and animal substance in nature, the living demonstration of its truth from the flood to the present day, would render it unquestionable. But if it means to affirm that the rational and voluntary powers of man render him capable of adapting things to his physiological powers which are not naturally adapted to them, so as to make them as perfectly congenial to his nature as things naturally adapted, it is utterly erroneous, and discovers a very superficial and limited knowledge of animal physiology. (§ 773.)

§ 871. Let us test this principle in another application. The natural drink of man appears to be water, or the juices of fruits, as in a pure state of nature, he has no other beverage prepared for him. But, once acquainted with the arts of brewing and distilling, he is enabled to manufacture as much intoxicating liquor as he wants, and can drink and be merry when he chooses. Now it is perfectly obvious that this is only a statement of what is true in regard to the mental and voluntary power of man to manufacture intoxicating liquors, and in regard to his physiological power so far to adapt himself to the use of them as a beverage, as to be able to drink them pretty freely without destroying life, for many years. But to carry out the principle, we must go further and assert

that, because man possesses these powers, he is set free from the law of instinct, which guides the lower animal to the pure fountain or stream of water to slake his thirst, and is made more godlike in the rational privilege of drinking a generous beverage which his own superior reason has enabled him to prepare for himself; and consequently, such a beverage is more congenial to his wants, and better fitted to develop the best powers of his nature: and therefore, while the lower animals, from birth to death, from generation to generation, are bound by the law of instinct to pure water as their natural drink, more godlike man is made free, by his reason, to regale himself with every beverage that he has the ingenuity and the ability to devise and prepare. (§ 608.)

§ 872. This reasoning would undoubtedly be received with high acclaim as soundest logic and philosophy, by multitudes of human beings whose rationality is perverted by the influence of depraved, sensual appetite. (§ 608.) But is it the true logic of sound physiology?—We know that it is not!—And yet it is quite as much so as the logic of those who endeavor to show that the reason of man not only lifts him above the law of instinct, but enables him with impunity, and even with advantage to his whole nature, to transgress that law at pleasure. Such philosophers ought to know that human reason is not substituted for animal instinct, but superadded to it, and established on the same constitutional laws, (§ 607.)—not for contrary, but for the same, and higher accordant purposes. And they may, with as much truth, deny the perfect harmony between the natural and moral attributes of the Deity himself, (§ 613.) as to deny the perfect correspondence between sound reason, and pure, natural instinct. (§ 771.—773.)

§ 873. No physiologist, I presume, will deny that the

instincts of the lower animals are founded on the physiological wants of the body, and established in perfect accordance with all the physiological powers and interests of the organized system to which they belong, and with the most determinate regard to the highest well-being of the individual and the species: and therefore, the law of instinct is not only a safe rule of action to the brute animal, but a strict conformity to it is essential to his highest welfare; and all deviation from it must be in some measure detrimental to him. Hence, though the horse, ox, sheep and other herbivorous animals (§ 849) can, by the exercise of the mental and voluntary powers of man, be trained to eat flesh and chew tobacco and drink ardent spirit, till they learn to love them, and greatly prefer them to their own natural diet, and feel dissatisfied and depressed and wretched without them, and languish and droop if they are suddenly withheld; and become so accustomed to them, and feel so dependent on them for comfort and enjoyment, that if they possessed the mental and the voluntary power, they would most certainly continue the use of them through life, and teach their progeny to do the same, yet in all that these habits differ from the pure, natural dietetic habits of those animals, and deviate from the law of undepraved instinct in them, they must be detrimental to the constitutional nature of those animals:—and none the less so, because the reason of man has been employed in creating and cherishing these habits:—nor would they be any the less so, if the rational and voluntary powers of man were superadded to the natural instincts of the brute and he should create and cherish them by the exercise of his own powers. But we have seen (§ 771.) that, as an animal, man is constituted with the same physiological powers and upon the same great physiological principles as those which pertain to

the constitutional nature of the horse, the ox and other animals; and that the faculties of instinct in man (§ 772.) are as determinate in their functional character, and established with as fixed and precise relations to the physiological wants and interest of his nature, as those of the lower animals are: and hence, in all that concerns the interests of organic life and animal existence, man is subject to the same general laws as those which govern the lower animals.

§ 874. Suppose a man and a horse to be standing together by a barrel of ardent spirit. The two animal bodies are constituted upon the same organic principles—have the same general tissue, (§ 156.) which are endowed with the same vital properties and arranged into similar organs, which have the same elements of functional power (§ 312.) and the same physiological relation to the nature and qualities of the ardent spirit. The horse has not the reasoning power to devise, nor does he know that he possesses the voluntary power to execute any plan by which he can draw a quantity of that spirit from the barrel and drink it:—but the man possesses both the rational and voluntary powers requisite for such a transaction. Now can any truly rational being believe for a moment that, in such a case, the possession of reason by the man, or rather the possession of rational faculties, can so nullify the physiological law of relation between his organic system and the nature and properties of the ardent spirit, as that, if he drinks it, it will be less detrimental to the functional powers of his organs, the vital properties of his tissues, and the general physiological interests of his system, than it would be to the horse? Yet this is a true illustration of the principle which they assume, who assert that man is naturally an omnivorous animal by virtue of his reason.

§ 875. If man is not organized to eat flesh in its natural

state, (§ 856.) and if flesh-meat is not congenial to the highest physiological interests of his nature, then no power of reason by which he is enabled to prepare flesh-meat and get it into his stomach, can render it suitable food for him or make him *naturally* an omnivorous animal; nor yet can it make him artificially an omnivorous animal without detriment to all the physiological properties, powers and interests of his nature.—The question is not simply what substances man can contrive to get into his stomach, and so adapt himself to them as to feel and believe they are very comfortable to him: but what substances are adapted to his stomach and other organs and to all the vital interests of his system. There are many substances in nature which man can, by artificial means, bring into such a condition as that he will be able to masticate and swallow them, but this is far from proving that all such substances may thereby be rendered subservient to the healthy nourishment and sustenance of his system.—In every thing that relates to the dietetic habits of man therefore, his reason must strictly accord with the pure law of his natural and undepraved instincts, or it is not true reason, but an erroneous exercise of his rational faculties; unless his deviation from that law be a case of necessity from the force of circumstances. For, as we have seen, (§ 735.) while man is created to be the lord of the earth and to occupy all portions of it—and is constituted with a wide range of adaptability to meet the exigencies of the circumstances and conditions in which he may be placed, yet it is always of necessity under this great and immutable law, that, in proportion as he turns aside from the truth of his natural and perfect constitutional adaptation, and educates himself, by virtue of his constitutional adaptability, to habits, circumstances and conditions, less adapted to the truth of his constitu-

tional nature, he impairs all the powers of that nature, diminishes the general sum of his enjoyment, and abbreviates the period of his earthly existence. (§ 773.)

§ 876. We see therefore, 1. That the whole evidence of comparative anatomy goes to prove that man is naturally a frugivorous animal: (§ 852.) 2. that the physiological capability of man to subsist on a mixed diet and to derive nourishment from almost every substance in the vegetable and animal kingdoms, is not peculiar to man but is common to all the higher classes of animals, and therefore affords no determinate evidence in relation to the natural dietetic character of man; and only proves the wonderful resources of animated nature and the wisdom and benevolence of God. (§ 866.) And 3. that human reason is not a substitute for animal instinct, but superadded to it, not to nullify, but to sustain its laws and to act in conformity with its pure dictates in supplying the alimentary wants of the body: and therefore the rationality of man neither lifts him above the physiological laws and relations of his animal nature, nor enables him to transgress those laws with impunity: (§ 773.) and consequently, the rationality of man in no measure determines his natural dietetic character. The evidence therefore, which remains to be considered, and by which the grand problem before us is to be conclusively solved, is purely physiological, and is derived from the comparative effects of vegetable and animal food in nourishing, developing and sustaining the human system in all its physiological and psychological properties, powers and interests.

§ 877. Notwithstanding the whole evidence of comparative anatomy goes to prove that man is naturally in no measure a flesh-eating animal, (§ 852.) yet it is a notorious fact, that he *can subsist* almost entirely on

animal food, (§ 788.) and that a considerable portion of the human family have partaken of it more or less freely ever since the flood: and so far as observation has been made, there appears to be about an equal measure of health, vigor and longevity among all the different portions of the race, whether they subsist exclusively upon vegetable or animal food, or upon a mixed diet of the two. (§ 15.) Hence, it is inferred that man has the physiological capability of subsisting, with equal benefit to his nature, upon either, or both kinds of aliment, according to the necessity or convenience of circumstances or situation: and therefore, it is asserted that the diet of man is to be determined by the climate in which he dwells: and that he will always find that food best for him which is most congenial to the climate, whether it be purely vegetable, as in the torrid zone, or purely animal, as in the frigid zones, or a mixture of the two, as in the temperate zones.

§ 878. But we have seen, (§ 867.) that this physiological capability is common to carnivorous, herbivorous, and frugivorous animals: and it is entirely certain that all these animals, if they were once accustomed to a mixed and artificially prepared diet, and endowed with sufficient mental and voluntary powers (§ 772.) to procure and prepare such a diet for themselves, would continue such dietetic habits from generation to generation, till they would learn to consider such a diet as both natural and necessary. Yet would all this aberration from nature, prove these animals to be naturally omnivorous? —Certainly not!—and as certainly the extensiveness and long continuance of omnivorous habits in man, do not, and cannot prove the human species to be naturally omnivorous.

§ 879. It is however contended that, the fact of man's

being so extensively—not to say universally omnivorous, proves that he is instinctively led to eat flesh-meat whenever he can get it, and therefore, it is as truly his natural aliment as fruit is. But this shows how carelessly and superficially men observe facts, and with what extreme looseness they reason on this important subject. Indeed, they almost always *feel* their way to their conclusions, rather than arrive at them by rigorously inductive reasoning, and consult their appetites more than they examine evidences. Tobacco is quite as extensively used by human beings as flesh-meat is; (§ 778.) and those who are accustomed to the use of it, would a thousand times sooner relinquish their flesh-meat forever, than to abandon their tobacco. Yet no one, I presume, will contend that this proves man to have a natural, instinctive desire or appetite for tobacco, and that tobacco was made for the use to which man has appropriated it. We know that man has naturally a deep and utter loathing of tobacco, and that he is obliged to overcome the most powerful antipathy of his nature in adapting himself to the use of it; but if every human being were trained to the use of tobacco so early in life and by such delicate and imperceptible degrees that we could not appreciate nor remember the first effects of it upon the system, it would be almost impossible for us to believe that man has not a natural, instinctive desire and necessity for it.

§ 880. It is precisely so in regard to flesh-eating. All who have perfectly sanctified themselves from animal food, and restored their instinctive faculties of smell and taste to something of their native purity, well know that flesh-meat is most loathsome to them. And if any number of human children were born of vegetable-eating parents and nursed by vegetable-eating mothers, and at a proper age accustomed to a purely vegetable diet, and never

permitted to smell animal food when cooking, nor to see others eat it, every one of them—if there were millions—would at first discover strong loathing if flesh-meat were given them for food, and they would spit it from their mouths with as much disgust as they would tobacco. But when children are born of flesh-eating parents and nursed by flesh-eating mothers, and are habituated from the hour of their birth, to the savor and the odor of animal food, in the nourishment which they derive from the mother's breast,—in the respiration and the perspiration of their parents and others around them, and in the fumes of the kitchen and the table,—and are accustomed to be fed with animal substances in their infancy, and to see their parents and others devour flesh-meat at almost every meal, they, as a matter of necessity, become depraved in their natural instincts, and almost as a matter of necessity, discover an early fondness for animal food. So in the East, where every human being smokes, it is nearly a universal custom for nursing mothers, every few minutes, to take the pipe from their own mouths and put it into the mouths of their sucking infants. The necessary consequence is that all those children early discover the greatest fondness for the pipe, and seize, and suck it with excessive eagerness whenever it is presented to them; and they are exceedingly discontented and fretful and unhappy if it is withheld from them: and therefore, according to the logic of those who would prove man to be naturally omnivorous from his dietetic habits, it is natural and proper for those infants and for all human beings to smoke, chew, and snuff tobacco.

§ 881. The truth is, as we have seen, (§ 771.) all animal beings, including man, are constituted upon certain physiological principles, out of which grow certain physiological wants; and upon these wants are established

certain faculties of instinct, with determinate relation to the nature and qualities of the appropriate supplies. (§ 700.) These faculties, while preserved in their integrity, are a law of truth to all; but they are capable of being depraved and rendered totally blind guides, which lead to the most pernicious errors. (§ 704. 707.) The lower animals have neither the mental nor the voluntary powers to deprave their natural instincts to any considerable extent, and therefore they remain, from birth to death and from generation to generation, subject to the law of instinct, and with little deviation from their truly natural dietetic habits. (§ 608.) But man, possessing the mental and voluntary power to deprave his natural instincts, has exercised that power so freely and so extensively, that he no longer seems to be able to discriminate between his truly natural, and his depraved instincts and appetites, nor to distinguish his artificial from his natural wants.—Let it be remembered however, that the whole range of physiological adaptation in man and other animals, admits of little variation from the great law of relation, in regard to the proportions of nutritious and innutritious matter, in the alimentary substances on which the animal subsists or to which the animal becomes adapted. (§ 749.)

§ 882. As to the statement that the different portions of the human race appear to have enjoyed about an equal amount of health, vigor and longevity, whether their food has been purely vegetable, or purely animal or a mixture of the two, (§ 877.) let it be understood that, so far as we are informed, no considerable portion of the human family ever intelligently adopted any particular mode of living, upon clear and well ascertained physiological principles, and consistently and perseveringly, from generation to generation, adhered to a course of diet and general

regimen, conformable to all the laws of life: but on the contrary, nearly every thing in the nature, condition and circumstances of man, from the first transgression to the present hour, has served to fix his attention continually on present enjoyment, (§ 32.) with no further regard to future consequences than experience has taught him to be necessary, in order to avoid sudden destruction or intolerable distress; and hence, as we have seen, (§ 649.) the grand experiment of the whole human family, seems ever to have been to ascertain how far they can go in indulgence,—how near they can approach the brink of death, and yet not die so suddenly and violently as to be compelled to know that they have destroyed themselves.— Whether therefore, men have subsisted wholly on vegetable, or on animal food, or on a diet consisting of both, they have done so without any regard to correct physiological principles, either in relation to the quality, quantity, or condition of their food,—or in relation to other physiological wants and habits of the body, which are nearly as important to the general welfare of the system as the quality and condition of the food. If their climate and circumstances have been less favorable than others to health, vigor and longevity, they have learned from experience how far, as a general rule, they must restrain their indulgences, and in what manner they must regulate their habits and appetites, so as to secure life long enough for one generation to become the progenitors and nurturing protectors of another generation. (§ 653) And if their climate and circumstances have been more favorable than others to health, vigor and longevity, they have also learned from experience, how far they may go in indulgence, and still keep within the bounds necessary for the perpetuation of the race. So that, in all cases, as a general rule, what they have wanted in natural advantages, they

have made up in correctness of habits, and what they have possessed in natural advantage, they have squandered in erroneousness of habits. If their climate has been salutary, they have indulged the more freely in dietetic and other excesses.—If their food has been congenial to their nature, they have balanced, or counteracted its good effects by other things unfavorable to health and vigor and longevity: and, in this way, the whole human family, whether inhabiting frigid, torrid, or temperate zones,—whether dwelling on high mountains, or in low valleys,—whether residing in ceiled houses, or living in tents or in the open air,—whether subsisting on animal or vegetable food, or on a mixed diet of the two,—whether eating their food in its simplest and most natural state, or cooked and prepared in the most complicated manner,—whether confined to simple food and water, or indulging in every variety of condiments and stimulating and intoxicating liquors and substances, (§ 778.)—whether moderate or excessive in quantities,—whether cleanly or filthy,—whether chaste or lewd,—whether gentle or truculent,—whether peaceful or warlike, have, in the great experiment to ascertain how much indulgence the human constitution is capable of sustaining without sudden destruction, so balanced their good and evil as to preserve throughout the world and for many centuries, very nearly a general and uniform level in respect to health, vigor and longevity.—This statement however, is general and admits of many particular exceptions of individuals, and sects and societies and perhaps tribes; but these exceptions in no case militate against its truth as a general statement, nor against any of the facts on which it is predicated: for these are all most indubitably true; and the general reasoning and induction from them are irrefragably correct: and the whole is of so much importance to

a correct understanding of the phenomena of human history with reference to physiological principles, that it ought continually to be borne in mind as we proceed with our investigations on the subject before us; and especially, in ascertaining and appreciating the physiological evidence of the natural dietetic character of man.

§ 883. The fact then, that a large portion of the human family actually have, for many centuries, and probably ever since the flood, subsisted to a greater or less extent on animal food, or on a mixed diet of vegetable and animal food, and apparently done as well as those who have subsisted wholly on vegetable diet, does not in any degree invalidate the evidence of comparative anatomy that man is naturally and purely a frugivorous animal. (§ 852.)

§ 884. In entering upon the consideration of the purely physiological evidence in relation to the natural dietetic character of man, (§ 814.) it is necessary that we should clearly understand and keep in view those nice physiological principles by which the character and force of the evidence are to be determined.

§ 885. We have seen that, the human body is formed from the common matter of the world, (§ 118.) brought into organic arrangement and structure by vital forces acting in and by living organs, (§ 121.) and that these organs are composed of several primary tissues which are endowed with certain vital properties, which constitute the elements of the functional power of the organs. (§ 312.) These properties of the primary tissues have a certain range of increase and diminution consistent with the continuance of vital control. By some means they are exhausted,—by others they are replenished. When these vital properties are healthfully increased, there is always a corresponding increase of function, power and activity in the organ or organs to

which the tissues belong: and when they are diminished there is always a corresponding debility and sluggishness and languor of function. The action of all extrinsic laws and agents upon us, (§ 126.) tends to exhaust our vital properties;—and all our intrinsic actions and operations—both voluntary and involuntary, have an exhausting effect upon the acting organs. (§ 376.) Even in the performance of those very functions which belong to the economy of nutrition, and which co-operate to replenish and repair the exhaustions and injuries of the system, each organ necessarily suffers some exhaustion of its vital properties and waste of its organized substance from its own particular action. (§ 697.) Hence all our organic operations from birth to death, simultaneously carry on the two great processes of vital exhaustion and repletion —of organic composition and decomposition—of destruction and renovation. (§ 314.)

§ 886. Were the *constitutional principles* upon which this renovating capability of the vital economy depends, in themselves inexhaustible, then were these bodies of ours, even in the present state of being, capable of immortality:—and by strictly obeying the laws of life, we might live on forever, in the eternal ebb and flow of vital energy, and the unceasing incorporation and elimination of matter! But this is not so. The vital constitution itself wears out!—The ultimate powers of the living organs, on which their replenishing and renovating capabilities depend, are, under the most favorable circumstances, gradually expended and finally exhausted. (§ 133.)

§ 887. Though the vital energies and sensibilities, therefore, which we exhaust to-day, are replenished to-morrow, yet of necessity, the process has taken something from the measured fund of life, and reduced our vital capital in proportion to the frugality or the profligacy of our

expenditure.—However proper the nature and condition of our aliment,—however completely all our laws of external relation are fulfilled,—however perfectly the functions of our organs are performed, and however salutary their results, yet, every digestive process of the stomach,—every respiratory action of the lungs,—every contraction of the heart, draws something from the ultimate and unreplenishable resources of organic vitality: (§ 697.) and consequently the more freely and prodigally we expend the vital properties of our organs, the more rapidly we wear out the constitutional powers of replenishment, and exhaust the limited stock of life. (§ 885.) Nothing can therefore, be more dangerously fallacious than the opinion which is too generally cherished and too frequently promulgated, that, our daily trespasses upon the laws of life, are as the dropping of water upon a rock—wearing indeed, but so slowly and imperceptibly, as scarce to make a difference in the duration and in the comfort of our lives.

§ 888. In explaining and illustrating the constitutional laws of external relation, I stated (§ 707.) that every substance in nature, from which the human body can derive nourishment, possesses specific and peculiar qualities, which the human organs have vital powers to perceive and appreciate. (§ 736.) Thus the visual properties of things, are perceived by the special sense of sight, (§ 566.) the auditory properties, by the special sense of hearing, (§ 252.) the olfactory properties by the special sense of smell, (§ 701.) the gustatory properties by the special sense of taste, (§ 707.) and the tangible properties by the special sense of touch. (§ 253.) These external substances have also certain other properties, which are only perceived and appreciated by the special organic senses, (§ 296.) residing in the organs belonging to the domain

of organic life, or the ganglionic system of nerves. (§ 228.) These properties, in all proper alimentary substances, are the natural and appropriate stimuli of those nerves of organic sensibility, (§ 230.) which are adapted by the Creator to perceive and appreciate them, and to convey the impressions received from them, to the special centre which presides over the functions of the particular organ or apparatus. (§ 219.) But we have seen (§ 743.) that, some alimentary substances are much more stimulating than others, in proportion to the quantity of nourishment which they actually afford the system, and that some substances in nature are purely stimulating without affording any nourishment. (§ 745.)

§ 889. The stimulation produced by these various substances, is always necessarily exhausting to the vital properties of the tissues on which they act, just in proportion to its degree and duration:—and every stimulus impairs the vital susceptibilities and powers, just in proportion as it is unsuited for the real wants of the vital economy and unfriendly to the vital interests.

§ 890. But whatever may be the real character of the stimulus, every stimulation to which the system is accustomed, increases, according to the power and extent of its influence, what is called the tone and the action of the parts on which it is exerted, and **WHILE THE STIMULATION LASTS, IT ALWAYS INCREASES THE FEELING OF STRENGTH AND VIGOR IN THE SYSTEM**, whether any nourishment be imparted to the system or not.

§ 891. Yet by so much as the stimulation exceeds in degree, that which is necessary for the full and healthy performance of the function or functions of the organs stimulated, by so much the more does the expenditure of vital power and waste of organized substance, exceed for the time, the replenishing and renovating economy of the

system; (§ 512.) and consequently, the exhaustion and indirect debility which succeed the stimulation, are always necessarily commensurate with the excess. (§ 745.)

§ 892. Hence, though that food which contains the greatest proportion of stimulating power to its quantity of nourishment, causes, while its stimulation continues, a *feeling* of the greatest strength and vigor, it also necessarily produces the greatest exhaustion in the end, which is commensurately importunate and vehement in its demands for relief, by the repetition of the accustomed stimulus; and, as the same food more readily than any other, affords the demanded relief, by supplying the requisite degree of stimulation, our feelings always lead us to believe that it is really the most strengthening.

§ 893. Hence, whenever a *less* stimulating diet is substituted for a *more* stimulating one, a corresponding physiological depression, or want of tone and action, always necessarily succeeds, varying in degree and duration, according to the general condition of the system, and the suddenness and greatness of the change: and this depression is always attended by a feeling of weakness and lassitude, which is immediately removed, and the feeling of strength and vigor restored, by the accustomed *degree* of stimulation, by whatever produced, whether any increase of nourishment is actually afforded to the system or not.

§ 894. The pure stimulants therefore, (§ 743.) which of themselves afford no nourishment to the system, and only serve to increase the expenditure of vital properties and waste of organized substance, by increasing vital action, (§ 745.) cause, while their stimulation lasts, a sense of increased strength and vigor:—and thus, we are led by our feelings, to believe that the pure stimulants are really strengthening:—and in the same manner we are deceived by even those pernicious stimulants which not only ex-

haust by stimulation, but irritate, debilitate and impair, by their deleterious qualities. (§ 778.)

§ 895. The feeling of *strength* produced by stimulation therefore, is no proof, either that the stimulating substance is nourishing or that it is salutary, nor even that it is not decidedly baneful.

§ 896. But we have seen (§ 745.) that, those proper alimentary substances whose stimulating power is barely sufficient to excite a full and healthy performance of the functions of the digestive organs, in the appropriation of their nourishment to the system, are most conducive to the vital welfare of the body, in all respects,—causing all the processes of assimilation and organization to be most perfectly performed, without any unnecessary expenditure of vital power, (§ 885.) and thus contributing to the most permanent and uniform health and vigor of the body, and to the greatest longevity. For every degree of stimulating power beyond this, necessarily increases the vital exhaustion without contributing in any measure to the welfare of the body.

§ 897. With a true application of these well ascertained principles, the physiological evidence in relation to the natural dietetic character of man, may be correctly apprehended and accurately estimated:—yet the utmost caution, (§ 776.) and perspicacity and circumspection are requisite at every step, to avoid deception and error in the mazy and delusive paths of human experience and history.

§ 898. It is generally, and perhaps universally believed by those portions of the human family which subsist on animal food, either wholly or in part, that man requires a more nourishing and invigorating aliment than can be derived from the vegetable kingdom, and therefore, that without the use of animal food, his body cannot be proper-

ly nourished and sustained. "An entire abstinence from flesh," says Buffon, (§ 811.) "can have no effect but to enfeeble nature. If man were obliged to abstain totally from it, he would not—at least in our climates, either multiply or exist;"—and this is but the declaration of the common sentiment of flesh-eaters. But a correct examination of the subject will show that this position is a mere assumption in the face of facts, and as utterly destitute of any foundation in truth, as are the anatomical reasonings from the fancied resemblance of the human teeth and digestive organs to those of carnivorous animals.

§ 899. It is indeed, surprising that observing and reflecting minds, even long before the experiments of science had afforded demonstrations of the truth, did not detect and proclaim the error of the common notion, that flesh-meat is a more nutritious aliment for man than the best vegetable food. A proper attention to the history of the human race, might long ago have convinced the world of the inaccuracy of such an opinion. But unfortunately for man, he learns but little from experience, either in his individual or aggregate capacity; and Wisdom, though she meets him in ten thousand forms, and seeks to win him in ten thousand ways, is left unheeded by him, because his attention is so continually and completely engrossed in the present feeling and impulse, and in the pursuit of the most immediate gratification.

§ 900. From the careful investigations of some of the ablest and most accurate chemists of the present age, it appears that the various kinds of flesh-meat average about thirty-five per cent. of nutritious matter, while rice, wheat and several kinds of pulse, such as lentils, peas and beans, afford from eighty to ninety-five per cent.—And even potatoes, which, by some writers on human diet, have been denounced as too crude and innutritious for

the aliment of man, afford twenty-five per cent. of nutritious matter. So that, according to these results, a single pound of rice, absolutely contains more nutritious matter than two pounds and a half of the best butchers' meat: and three pounds of good wheat bread contain more than six pounds of flesh: and three pounds of potatoes, more than two pounds of flesh.

§ 901. Incredible as this may at first appear, to those who have given but little attention to the subject, yet a reference to facts in the history of the human species, will abundantly prove the correctness of what is here stated. According to the united testimony of all the ancient writers who have spoken of the primitive generations of mankind, the first of the species, as we have seen, (§ 779.) subsisted entirely upon vegetable food, in the plainest, simplest and most natural forms.

§ 902. Farinaceous seeds contain a greater proportion of nutritious matter, than any other kind of natural aliment: and it is more than probable that these, and other farinaceous vegetables in some form or other, have in all ages of the world, constituted "the staff of life" to the greater part of the human race, and that this kind of food mainly constituted the healthful and invigorating diet, not only of the antediluvians, but also of those who have occupied that period in the history of every nation, which all their earliest writers call the golden age. (§ 648.)

§ 903. Different opinions have been entertained in regard to the dietetic use of flesh in the latter part of the antediluvian period. The enormous wickedness and atrocious violence and outrages of mankind immediately preceding the flood, strongly indicate, if they do not prove an excessive indulgence in animal food. The fact also, seems to be implied in the Divine annunciation to Noah after the flood, that every living thing that moveth,

as well as the green herb, is constituted to afford nourishment to the human body; and is strongly evinced by the great and somewhat sudden abridgement of the period of human existence after the deluge. It appears to be very certain however, that if such was the fact, the custom was a very great innovation on the early habits of the antediluvians, and that it had not long prevailed, before the terrible catastrophe of that period. Still it does not appear from the Mosaic record that Noah received any Divine "permission" to eat flesh, before the deluge:—for in the sixth chapter of Genesis we find him instructed, to gather, and take with him into the ark, of all food that was eaten, which should be for food for him, and for all the animals with him.—Nor is there any historical evidence that animal food came into general, and common and frequent use, until many centuries after the flood.

§ 904. During the days of Abraham, flesh seems to have been eaten only on special occasions; such as some of their religious and social feasts, and when strangers were entertained as guests. The same general custom continued down even to the time of the bondage of the Hebrews in Egypt; and during their long and severe servitude there, it appears that they subsisted mostly on the products of the vegetable kingdom; as indeed the inhabitants of that country have ever done, even to the present day. Coarse bread with cucumbers, melons, leeks, garlics, onions, and other vegetables constituted the principal part of their diet; and with these—more however as a condiment than as an aliment, they consumed perhaps, occasionally, a small quantity of fish; and on particular occasions, they indulged in flesh-meat. During their extremely tedious and winding journey through the wilderness, in which they were forty years in getting into a place which lies but about three hundred

miles from Egypt, they subsisted entirely on vegetable food, except that they were a very few times suffered to indulge in flesh. For, their manna appears to have been—if not real vegetable structure, at least of the nature of vegetable substance; and it seems to have become dry and hard; for “the people went out and gathered it and ground it in mills, and beat it in mortars, and baked it in pans and made cakes of it.” And after the conquest and possession of the “Promised Land,” and the full establishment of the nation in Palestine—excepting the more luxurious and voluptuous few, the Jews ate but little animal food, and that principally on the occasion of their religious and social feasts and special hospitalities. In the reign of Saul their first king, we find Jesse, who was the owner of probably extensive flocks and herds, sending his son David, not with beef and mutton, but “with parched corn and loaves of bread to his sons in the army and with cheeses to the captains of thousands.”

§ 905. It has been supposed by some that the Jews and other nomadic or shepherd tribes, who possessed extensive flocks and herds, must have made a free use of the flesh of their sheep and other animals, in their ordinary diet; because, say they, no other sufficient reason can be perceived why they should possess themselves of such property, and be so anxious to increase it. But it should be remembered that, besides the tendency of their religious institutions to lead them to cultivate such possessions, this species of property constituted their wealth, and gave them respectability and influence in their tribe or nation, the same as do many acres of land, or many slaves, or ships, or much merchandize or money, the husbandman, or planter, or merchant, or banker; and

hence, the extensiveness of their flocks and herds, was a source of ambition and pride and satisfaction to them.

§ 906. This same state of things is found even at the present day, among the nomadic or shepherd tribes in Asia and Africa, and in fact, in all parts of the world. The enterprising Landers inform us that in their late expedition in Africa, they found tribes “ who possessed abundance of bullocks, pigs, goats, sheep and poultry, but they preferred vegetable food to animal:—notwithstanding which, their animals were always held exceedingly dear, because the owners took pride in displaying the number and quality of them.” (§ 1042.)

§ 907. It is well known that from the earliest period of their history, the people of India generally, and particularly the Hindoos, who constitute a considerable portion of the human family, have subsisted mainly on vegetable food, making rice the principal article of their diet.—And indeed the greater part of the inhabitants of Asia and Africa, have in all ages, derived nearly all of their sustenance immediately from the vegetable kingdom. “ Children of the sun!” said one of the ancient and distinguished priests of India, “ listen to the dying advice of your faithful and affectionate instructor who hastens to the bosom of the great Allah, to give an account, and to enjoy the expected rewards of his services. Your regimen ought to be simple and inartificial. Drink only the pure, simple water! It is the beverage of nature, and not by any means, nor in any way to be improved by art!—Eat only fruits and vegetables!—Let the predaceous animals prey on carnage and blood!—Stain not the divine gentleness of your natures, by one spark of cruelty to the creatures beneath you!—Heaven, to protect them, hath placed you at their head!—Be not treacherous to the important trust you hold, by murdering those you

ought to preserve!—nor desile your bodies by filling them with putrefaction!—There is enough of vegetables and fruits to supply your appetites, without oppressing them by carrion or drenching them in blood!”

§ 903. Many parts of Asia are far too densely populated to admit of any considerable indulgence in animal food:—for it is a well ascertained truth, that the use of animal food diminishes the alimentary resources of the human family, in all densely populated countries.

It has been estimated by some writers on political economy, that the soil which is necessary to raise animals enough to supply the alimentary wants of one man who subsists wholly on animal food, will produce vegetable substance enough to sustain sixteen men who subsist wholly on vegetable food. Hence in China, where the population is so dense as to form almost a crowded congregation of hundreds of millions of human beings, (§ 1039.) the nourishment of the people is of necessity, derived immediately from the soil, which is made to produce two crops of rice annually, to meet the alimentary wants of its cultivators,* and the small portion of animal food which they derive from domesticated animals, such as hogs, cats, dogs, &c. fed on the offals of the house, is nothing more than a mere condiment to their rice and other vegetable substances. And then again, on the other hand, it is because the soil of China is capable of being made to produce two crops annually, of one of the most nutritious vegetables in the world, that it is able to sustain such a population. It is therefore, only in those countries where the population is small in proportion to the extent of soil, that the inhabitants can indulge freely in the dietetic use of flesh,

* The population of China in 1812 was 361,279,897: making an average of 278 individuals to the square mile, throughout the empire.

unless they are a commercial people and derive their supplies of animal food from other countries.

§ 909. The early inhabitants of Greece and Rome, and of Europe generally, subsisted almost entirely on vegetable food. The Spartan simplicity of diet, was by no means peculiar to Sparta nor to Greece. “The Romans encouraged the use of vegetable diet, not only by the private example and precepts of many of their great men, but also by their public laws concerning food, which allowed but very little flesh, but permitted without limitation all kinds of food gathered from the earth, from shrubs and from trees.”

§ 910. Plutarch, a man of great learning and extensive research, who flourished long after the stern simplicity of Roman virtue had passed away,—long after the foundations of the Roman Empire had begun to crumble under the influence of luxury and excess, thus expresses himself on the subject of human diet: “I think it were better to accustom ourselves from our youth to such temperance as not to require any flesh-meat at all. Does not the earth yield abundance, not only for nourishment, but for luxury! some of which may be eaten as nature has produced it, and some dressed and made palatable a thousand ways.”

911. The inhabitants of modern Europe, even at the present day, to a very great extent, subsist on the immediate products of the vegetable kingdom.—The peasantry of Norway, Sweden, Denmark, Poland, Germany, Turkey, Greece, Italy, Switzerland, France, Spain, Portugal, England, Scotland, Ireland; and a considerable portion of Russia, and most other parts of modern Europe, subsist mainly, and many of them entirely on vegetable food:—The peasantry and laboring people of modern Greece, subsist on coarse brown bread made of

unbolted meal, and on different kinds of fruits, which they eat with their bread: and they are remarkably vigorous and active and cheerful. "In all the world," says a recent traveller in Italy, "there is not to be found a more lively, mercurial population, than the lazzaroni and laborers of Naples, whose diet is of the simplest kind, consisting mainly of bread, macaroni, (a vegetable dish,) or potatoes, and the fruits of the season, including a large supply of watermelons for their greatest luxury, with water for their drink. They are generally tall, stout, well formed, robust and active men."—The peasantry in many parts of Russia, live on very coarse bread with garlies and other vegetable aliment; and like the same class in Greece, Italy, and other parts of Europe, they are obliged to be extremely frugal even in this kind of food, yet they are very healthy, vigorous and active. Many of the inhabitants of Germany live mainly on rye and barley, and mostly in the form of coarse bread. The Swiss peasantry subsist in much the same manner: and a very similar diet sustains the same class of people in Sweden, Poland, Spain, Portugal and many parts of France. In the last three named countries however, fruit is more abundantly used than in the others; but in all these countries, the people who live in this manner, and refrain from the use of alcoholic and narcotic drinks and substances, are well nourished, healthy, robust, active and cheerful.

§ 912. The potato, as is well known, is the principal article in the diet of the Irish peasantry; and few portions of the human family are more healthy, robust, athletic and active, than they are, when uncontaminated by intoxicating substances, both alcoholic and narcotic. But alcohol, either in the form of distilled or fermented liquors, and tobacco, opium, coffee, and tea, have extend-

ed their blighting influence, as we have seen, (§ 778.) over the greater portion of the human world:—and nowhere do these scourges of mankind, more cruelly afflict the self-devoted race, than in the cottages and hovels of the poor.—“I would sooner live on two beans a day than do without my snuff,” exclaimed an aged female mendicant, to a gentleman who expostulated with her for indulging in the vile practice of thrusting powdered tobacco up her nose, even when in the act of asking alms!—“O! it does me good!—I could not live without it!” said she:—and doubtless she sincerely *felt* that what she said was true.—And this is but the miniature resemblance of a large portion of the human species.—And when by these indulgences, and the consequent neglect of cleanliness (§ 882.) and other means of health, they generate a variety of chronic diseases, and sometimes extensive epidemics, we are told, even by professional men of character, that all these evils arise from their *poor, meagre, low, vegetable diet*.—Yet whenever these different species of intoxicating substances are avoided, and a decent degree of cleanliness observed, the vegetable diet is not thus calumniated.

§ 913. That portion of the peasantry of England and Scotland, who subsist on their barley and oatmeal bread and porridge, and on potatoes and other vegetables, with temperate and cleanly habits, are healthy and robust and active, and able to endure more fatigue and exposure than any other class of people in the same countries.

§ 914. In short, from two thirds to three fourths of the whole human family, in all periods of time, from the creation of the species to the present moment, have subsisted entirely, or nearly so, on vegetable food; and always, when their alimentary supplies of this kind have been abundant and of a good quality, and their habits

have been in other respects correct, they have been well nourished, and well sustained in all the physiological interests of their nature.

§ 915. But if one pound of good bread absolutely contains more nutritious matter than two pounds of flesh-meat, (§ 900.) why is it that those who are accustomed to animal food, immediately droop and feel weak and languid when flesh-meat is wholly withheld from them? and why is their usual vigor restored when they return to their customary diet?

§ 916. It is now well ascertained and universally acknowledged by those who are properly informed on the subject, that flesh-meat is far more stimulating or exciting in proportion to the quantity of nourishment which it actually affords the human body, than proper vegetable food is:—and we have seen (§ 890.) that whatever be the real character of the stimulating substance, every stimulation to which the system is accustomed, increases, according to the power and extent of its influence, what is called the tone and action of the parts on which it is exerted, and the whole domain of organic life being intimately united by a common and universal sympathy (§ 225.) is correspondently affected; and hence, while the stimulation lasts, it always increases the *feeling* of strength and general vigor in the system, whether any nourishment be imparted or not. By so much therefore, as flesh-meat is more stimulating than vegetable food, it gives to those who are accustomed to it, a *feeling* of greater strength and vigor: and as it is a law of the vital economy (§ 893.) that whenever a *less* stimulating diet is substituted for a *more* stimulating one, a corresponding physiological depression, attended with a feeling of weakness and lassitude, always succeeds,—and as this physiological depression is promptly removed, and a feeling of

strength and vigor restored by a return to the customary stimulus, (§ 892.) those who are accustomed to animal food, and have only made temporary experiments of abstinence from it, have always found that, when they abstain wholly from flesh-meat, they feel weaker and less energetic, and when they return to it, they feel stronger and more vigorous and active: and hence, they have inferred that, animal food is much more nourishing and strengthening than pure vegetable food is.

§ 917. But if this kind of *experience* proves animal food to be more nourishing and strengthening than vegetable food, then it also proves that, the pure stimulants which actually afford no nourishment to the system, are really invigorating to the body: (§ 894.) for, every one who is accustomed to the use of the pure stimulants, always experiences a physiological depression and feeling of debility and lassitude from the sudden disuse of them, commensurate with the degree to which the system had been affected by them, or made dependent on them for tone and action; and this depression is instantly removed and the feeling of strength restored by a return to the use of the accustomed stimulants. Hence all who habitually use the pure stimulants, and especially the diffusible stimulants, such as the alcoholic, fully and sincerely believe that their bodies are invigorated and rendered stronger, and capable of more effort and endurance, by the use of such stimulants.

§ 918. It is true however, that as the pure stimulants afford no nourishment to the system, and flesh-meat nourishes while it stimulates, the physiological depression and general emaciation and debility experienced from a sudden abandonment of the latter, though less violent and distressing at first, are generally of greater duration, and

sometimes even more dangerous to life than from a sudden abandonment of the former.

§ 919. But as flesh-meat is more stimulating to the system in proportion to the nourishment which it affords, than pure vegetable aliment is, (§ 916.) so all the processes of assimilation and nutrition in the use of the former, are more rapid, and attended with a greater expenditure of vital power and waste of organized substance, than in the use of the latter. (§ 889.)—The flesh-meat in the stomach, the chyme formed from it, in the alimentary cavity, the chyle in the lacteals, the blood in the heart, arteries, veins and capillaries, and all the fluids and substances elaborated from the blood, are more exciting to the parts on which they severally act, and cause a greater intensity and rapidity of vital action and expenditure in the whole system than is effected by alimentation, digestion and nutrition in the use of pure and proper vegetable food.* (§ 1001.) And hence the well known fact, that in the most healthy and robust men who have been accustomed to a pure vegetable and water diet from infancy, the skin is uniformly much cooler and the pulse is slower from ten to thirty beats in a minute, than in those who subsist on a mixed diet, in the ordinary manner of civil life. (§ 486.)

§ 920. As flesh-meat passes more rapidly through all the processes of assimilation than most kinds of vegetable food, (§ 919.) it is generally supposed to be more easily digested; and consequently the most suitable food for the dyspeptic and those of feeble digestive powers: and hence it has been a prevailing practice among physicians, to prescribe for such persons, a diet consisting mostly of

* The feverish excitement attending the digestion of flesh-meat has been called by medical writers, "the fever of digestion."

flesh-meat. But this is contemplating the assimilating functions of the living body as purely chemical, and the stomach and other organs as mere lifeless vessels which have no direct agency in the processes effected in the substances which they contain: (§ 435.) and therefore, the digestibility of different alimentary substances, is determined purely by the time required for their solution.—Such a view of the subject however, is very far from being correct. The assimilating processes of the living body are to be contemplated by the physiologist as purely vital,—effected by the living organs, and attended with an expenditure of the vital properties of the tissues, and the functional powers of those organs; (§ 885.) and consequently, in the true physiological sense of language, the ease or difficulty with which any alimentary substance is digested by the human stomach, is not determined by the time in which it undergoes the chymifying process of that organ, but exclusively by the amount of vital power required to digest it.—The substance which causes the greatest expenditure of vital power in undergoing the functional process of the digestive organs, and leaves those organs most exhausted from the performance of their function, is the hardest, or most difficult to digest, whether the time in which it is undergoing that process be longer or shorter.

§ 921. But we have seen (§ 916.) that, flesh-meat is more stimulating in proportion to the quantity of nourishment which it affords to the human body, than pure vegetable aliment is, and that all the processes of assimilation and nutrition in the use of the former, are more rapid and attended with greater expenditure of vital power and waste of organized substance, than in the use of the latter. It is therefore, a physiological truth of great importance, that while animal food, or flesh-meat,

passes through the stomach in a shorter time than most kinds of vegetable aliment, and therefore, has been supposed to be more easily digested, yet it actually draws upon that organ and upon the sources of innervation for a greater sum of vital energy, and consequently causes a greater abatement of the sensorial power (§ 165.) of the brain and nervous system during the process of digestion, and leaves the stomach much more exhausted from the performance of its function, than vegetable food does.— And hence, they who subsist principally on animal food or flesh-meat, always feel more stupid and dull during gastric digestion, and feel a much greater degree of exhaustion in the epigastric region, when the food has passed from the stomach into the intestinal canal, (§ 338.) and suffer much more distress from hunger when deprived of their accustomed meals, (§ 892.) than they do who subsist entirely on a pure vegetable aliment. And this is one important reason why,—all other things being equal, and the system being fully established in its habits,—they who subsist on a well-chosen vegetable diet, can endure protracted labor, fatigue and exposure, much longer without food than they can who subsist mostly or entirely on flesh-meat.

§ 922. Though according to chemical analysis therefore, a pound of good wheat bread absolutely contains but fifty per cent. more of nutritious matter than a pound of flesh-meat, (§ 900.) yet the physiological difference between the two kinds of aliment, is much greater than is indicated by the results of chemical analysis. For, the flesh-meat, being much more stimulating than the bread, in proportion to the quantity of nourishment which it actually affords to the human body, not only exhausts the stomach more in the process of gastric digestion, but works the whole organic machinery of life with more

rapidity and intensity, (§ 919.) and therefore, causes a proportionably greater waste of the substance of the organs in a given time, and consequently, increases the demand of the system for fresh supplies of aliment. Hence, as extensive experiment has fully proved, two pounds of good wheaten bread will actually sustain a man accustomed to such a diet, longer and better than eight pounds of the best flesh-meat.

§ 923. The Russian and Greek laborers and those of many other countries, will work from twelve to sixteen hours a day, with great power and activity and cheerfulness, and subsist on about one pound of coarse bread with a small bunch of garlics, figs, raisins, apples or some other fruit containing little nourishment. While, according to Ross Cox, who spent several years beyond the Rocky Mountains, as an agent of the American Northwestern Fur Company, the Canadian boatmen and others in the Company's service, receive, according to stipulation, and regularly consume (when they have no other food) eight pounds of clear flesh a day for each man; and ten pounds if it contains any bone:—and these men, if their rations of food are cut short for two or three days, are exhausted and unstrung.—“The Patagonians,” says the Rev. Mr. Armes, who spent three months among them as a missionary, “subsist almost entirely upon the guanaco, which they take in the chase. They will often, in their indolence, suffer their provisions to run very low, and for two or three days, subsist on very little: and then, when urged by hunger, they will mount their horses and go out in pursuit of fresh supplies. And when they return with their game, it is a very common thing for a single Patagonian to consume from fifteen to twenty pounds of flesh in the course of a day.—Indeed, I have frequently seen a single man, after two or three days’

severe abstemiousness, consume at one meal, in the course of three hours, the half of a guanaco, which would weigh from fifteen to twenty pounds. This flesh was generally eaten very slightly cooked."—The accounts which have been given of the voraciousness of the Esquimaux and other flesh-eating tribes in the northern regions of Europe, Asia and America, and of the enormous quantities which they consume in a day and at a single meal, are almost incredible, yet they have been repeatedly corroborated by the best authority.—On the other hand again, millions of the inhabitants of India and China subsist on a few ounces of rice a day for each individual; and where they are in other respects temperate and correct in their habits, they are well nourished, and athletic and active.

§924. We have seen (§ 745.) that, in proportion as the stimulating effect of any alimentary substance exceeds what is necessary for the full and healthy performance of the functions of the organs of assimilation and nutrition, the vital action, not only of the particular organs, but of the whole system, is rendered more rapid and intense, all the functions are commensurately precipitated, and the vital processes of assimilation and nutrition are less perfectly effected. Hence, though while the health and integrity of the assimilating organs are preserved, the physical and chemical character of the chyle is nearly identical, whatever may be the alimentary substance from which it is elaborated, (§465.) yet the *vital constitution* of the chyle and blood, and consequently of the solids, is greatly affected by the quality of the food. When chyle is taken from the living vessels, the vital constitution of that which is elaborated from flesh-meat, is capable of resisting the action of inorganic affinities (§126.) only a short time; but will begin to putrefy in three or four days

at the longest: while the vital constitution of that which is elaborated from pure and proper vegetable aliment, will resist the action of inorganic affinities for weeks; (§ 466.) yet it will, in the end, putrefy with all the phenomena of that formed from flesh-meat,—thereby demonstrating that it has at least, equal claims to the character of animalized matter, and leaving little grounds to doubt that, in the processes of chymification and chylification, the vital changes are so much more complete and perfect, when the vegetable food is used, as to give the chyle more power of vital constitution to resist the action of the principles of putrefaction than is possessed by the chyle formed from flesh-meat. It is well known also, that human blood formed from animal food, will putrefy when taken from the living vessels, in a much shorter time and much more rapidly than that formed from pure vegetable aliment: and that there is always—other things being equal—a much greater febrile and putrescent tendency in the living bodies of those who subsist mostly on animal food, than in those who subsist wholly on pure vegetable aliment. Hence, if two healthy, robust men of the same age,—the one subsisting principally on flesh-meat, and the other exclusively on a diet of vegetable food and water,—be suddenly shot down and killed, in warm weather, and both bodies be laid out in the ordinary manner, and left to the action of the elements and affinities of the inorganic kingdom, the body of the vegetable-eater will remain two or three times as long as the body of the flesh-eater will, without becoming intolerably offensive from the processes of putrefaction.

§ 925. These then, are truths which defy all controversy —truths which are established in the constitutional nature of things, and confirmed by all correctly apprehended and accurately estimated facts in human experience, relat-

ing to the subject, that flesh-meat is not necessary to nourish and sustain the human body in the healthiest and best manner, where proper vegetable food can be obtained; (§ 923.) that it is much more stimulating to the system, in proportion to the nourishment which it actually affords, than a pure and proper vegetable diet; (§ 916.) that it renders the general physiological action of the system more rapid and intense,—accelerates all the vital functions, (§ 919.) increases the expenditure of the vital properties of the tissues and functional powers of the organs, (§ 312.) and more rapidly wears out the vital constitution of the body and exhausts the ultimate and un-replenishable resources of life: (§ 887.)—and it is almost equally certain that it renders all the vital processes of assimilation and nutrition less complete and perfect. (§ 924.)

§ 926. Animal food or flesh-meat, therefore, as a general law, is not so conducive as a proper vegetable diet, to healthfulness of growth—perfectness of development—symmetry—beauty—agility—perinanant strength—uniformity of health—and great longevity of the human body; nor to the acuteness and integrity of the special senses, and the activity and power of the intellectual and moral faculties. (§ 746.)

L E C T U R E X V .

Original perfection of the organic structure of man, and constitutional relations between the progenitor and the progeny—Original perfection of all created things—The human body the highest order of material forms, combining matter, life, mind and moral powers,—forming a part of the harmonious whole of nature—Fixed relations between bodily symmetry and mental and moral powers—This proposition illustrated—Fixed relations between the bodily symmetry and beauty, and the moral influence of man as an individual, and the moral character of society—This proposition illustrated—Moral power of personal beauty—This effect not from depravity, but from natural fitness—The original improvability of man asserted because of the present improvability of animals and vegetables—This position refuted—The truth of bodily perfection harmonizes with the intuitive sentiment of every soul that such perfection is the true bodying forth of intellectual and moral beauty—Beauty and vanity not necessarily connected—Perfect symmetry extremely rare—Power of beauty in the cause of virtue—Man's obligations to cultivate the bodily symmetry and beauty of the species—Illustration from Scripture—Natural harmony of all the attributes and interests of man's nature—The cultivation of beauty in the lower animals—Power of fashion in dress, &c.—Beauty seldom met with in civic life—Organized bodies produce their like—The results of the reproducing economy, how modified—These effects greatest in the primitive ages—The reactions of the vital powers under disturbing causes—Greatest deviations from normal results in the early ages—Mental and moral influences greatest on the reproducing economy in the primitive ages—Early separation into families, and forming of tribes—Varieties of the human species accounted for—Varieties of lower animals—Fixed relation between the economy of nutrition and reproduction—Means of securing symmetry of development and of returning to the perfect form of the original type of the species—The size and form of the human body, by what determined—Physiological laws of develop-

ment—Comparative effects of vegetable and animal food on the development and symmetry of the human body—Illustrations from the history of the human family—The flesh-eating tribes, Patagonians, &c.—Vegetable-eating tribes and nations—Original size of man, and other animals—Daniel and his three friends—Natives of different islands—The Cireassians, Irish, &c.—Pitcairn Islanders—The hermit—General conclusion on this topic.

§ 927. EVERY thing that we can learn from Nature and from Revelation concerning the character of the Deity, and of the harmonious principles of wisdom and benevolence and utility, which governed all his operations in the original creation and construction of this world of ours, with all its varied forms of matter and modes of existence, leads us to believe that God created our first parents perfectly beautiful:—that they were designed to be the grand types, or models of our species; and that, in them, was established a constitutional economy, by which like beings, in size, symmetry and beauty of body, and excellence of faculties and powers, were to be propagated through successive generations, so long as the species exists. (§ 125.) And God unquestionably, had a fixed purpose—a moral design in this.—God must himself be perfect; and all the elements of his character must be perfectly harmonious; and all that he produces by his immediate omnific efficiency, must partake of the perfection of its cause.—It must be, *a bodying forth of the truth and wisdom and beauty and harmony and benevolence of the Divine Mind, in appropriate forms.*

§ 928. We have seen (§ 140.—144.) that, from the simplest arrangements or combinations of the element or elements of nature, to the most complicated forms of matter,—throughout all the variety of material things, each particular form has its specific laws of constitution

and relation;—and by virtue of these laws, each form is what it is, in nature and in qualities, and has its own individual existence;—and all forms are held together in a harmonious universe.

§ 929. The human body is the highest order of material forms.—In it, matter and vitality and mind and moral feeling are mysteriously associated:—and, in our present state of being, not only hold fixed and precise relations to each other, (§ 613.) but to all things else in nature; (§ 7.) and thus, human nature constitutes an essential and congruent part of the harmonious whole:—and the entire and perfect harmony of all created things, in themselves, and in their relations to their Creator, requires that man should possess a nature perfect in its kind;—and that, there should be fixed and precise relations between the bodily symmetry and mental and moral powers of man.

§ 930. It is true that, in the present state of things, we often see the most splendid minds, and the most exalted moral characters that adorn our race, associated with infirm, and even with deformed bodies:—yet in all such cases, could we examine them with the eye of omniscience, we should probably perceive that, a want of mental and moral symmetry, corresponding with that of the body, always coexists.

§ 931. It is true also, that in bodies the most symmetrical and beautiful, there is frequently a want of the same degree of intellectual and moral beauty:—but in all such cases, there is either less symmetry of the entire organization, or great defect of education.

§ 932. With all the seeming contradictions in nature to the principles which I have advanced, therefore, I still contend for the interesting truth, that the most perfect intellectual and moral character of which human nature is capable, is only to be developed in the most

perfect body,—a body which is the most perfectly symmetrical,—not only in its general contour and proportions, but in all the details of its organization. And, if I am not over fanciful, this same doctrine was indicated in those regulations of the Mosaic dispensation, which required a lamb without blemish for certain sacrifices, and men without blemish for the priesthood.—And even in the choice of rulers and kings, in ancient times, this consideration had a very controlling influence. Thus, we are informed that Saul, the first king of the Jews, “was a choice young man and a goodly; and there was not among the children of Israel a goodlier person than he: from his shoulders and upward he was higher than any of the people,” and for these reasons mainly, he seems to have been selected for the first king of that nation.—Nor was this regulation peculiar to the Hebrews. Bodily symmetry and personal beauty were regarded by many, if not all of the ancient nations, as favorable evidences of the intellectual and moral powers of man.

§ 933. Nebuchadnezzar, king of Babylon, commanded the master of his eunuchs to select from among the captive children of Israel, “men in whom there was no blemish, but well favored and skillful in all wisdom and cunning and knowledge, and understanding science;—and such as had ability in them to stand in the king’s palace, and whom they might teach the learning and the tongue of the Chaldeans;”—and these were to be nourished with the king’s wine and food, for three years, to prepare them—as well in personal comeliness as other things, to stand before the king.—And, according to the sacred record, Daniel and his three particular friends, were, in the end, not less distinguished from the other selected children of Israel, for personal comeliness, than for their wisdom and knowledge and understanding.

§ 934. Socrates, the most eminent philosopher of antiquity, used to say that, when he saw a beautiful person, he always expected to find it animated by a beautiful soul. And Horace, the celebrated Roman Poet, says, in his Art of Poetry—" You must look for a perfect mind only in a perfect body."—In fact, this sentiment seems almost intuitive in our very nature. It is hardly possible for us to read the works of any author, which greatly interest and delight us, without forming a notion that the author is comely and agreeable in his or her person, unless we have either seen or heard the contrary.—And when, for the first time, we read the description of a favorite author, if we learn that he was or is symmetrical and comely in person, it harmonizes with our feelings, and accords with our notions of what is fit and proper and ought to be:—and if we learn that he was or is disproportioned, uncomely, dwarfish or deformed, our notions of the natural fitness of things, are shocked, and our feelings are dissatisfied.—And, on the other hand, we cannot look upon a symmetrical and beautiful person, of whom we know nothing, without being impressed with an idea of a corresponding intellectual and moral character. Indeed! the sight of a beautiful face or even of a beautiful hand or foot, when nothing more of the person is seen, almost necessarily causes us to imagine that the whole body to which that portion belongs, is equally symmetrical and beautiful!—Such is our—seemingly innate idea of the natural fitness and harmony of things:—and this, being universally true of the human race, amounts to a strong, if not conclusive proof, that, God, in the original constitution of things, established fixed and precise relations between the bodily symmetry and beauty, and the intellectual and moral powers and character of man.
(§ 929.)

§ 935. In the original constitution of things also, the Creator established the most determinate relations between the bodily symmetry and beauty, and the moral influence of man, as an individual, and the moral character of society.

§ 936. This important truth is a living sentiment in every human breast,—and I had almost said that, it is an element in our intellectual and moral constitution.

§ 937. In all ages of the world, mankind have been so strongly impressed with this sentiment, that, they have at times, conceived that it extends to the lower animals, and even rules in the breasts of the most ferocious beasts of the forests:—and accordingly, fables of antiquity tell us that the tiger has melted into kindness, and the lion has crouched in lamb-like gentleness in the presence of the overpowering loveliness of woman!—But whether lions and tigers ever felt the subduing influence of human loveliness or not, it is certain that spirits not less fierce, and hearts not less ferocious, have bowed before its moral omnipotence!—God only knows to what extent the moral influence of female beauty has affected the destinies of the human race!—But all history and all tradition, and the every-day experience of every generation of our species, conspire to prove its vastness and importance.—The Grecian Helen, and the Egyptian Cleopatra, whose charms involved whole nations in long and bloody wars, and affected the history, and modified the character and condition of the world, are only the more conspicuous instances, of what, in every period of time and in every quarter of the earth, has been experienced by mankind.—Who has not felt the power of female loveliness?—and who has not witnessed the moral influence which a beautiful woman exerts on all around her, if her mental and moral qualities correspond

with the symmetry and comeliness of her person?* The sage, even in the winter of his years, when all his natural sensibilities seem chilled, and chastened down by time, and stoic wisdom,—the veteran hero,—the grave divine,—the crafty politician,—all true to Nature, in this respect, like the ardent youth, and like the unsophisticated and untutored child of the forest even in his rudest state, instantly feel a peculiar and irresistible influence break upon them,—subduing their sterner and their harsher passions, and kindling a warm and generous emotion in their breasts, when a beautiful woman comes into their presence.

* The celebrated and beautiful Georgiana Spencer, Duchess of Devonshire, is an instance of this kind.

“A traditional halo invests this beautiful, accomplished, and virtuous lady. From her cradle she was as beautiful as Hebe, and her mind is said to have been beautiful as her person. For many years she led the fashion at the Court of George III., and perhaps was the only woman of fashion, in that reign, who did not lose caste by mixing in the strife of polities. From the moment that Lady Georgiana Spencer appeared in public, she was the object of admiration, from both sexes. If her own sex envied her the possession of extreme loveliness, the suavity of her manners and the purity of her mind dispelled the bitter feeling.

“She was an accomplished musician—drew well—knew many of the modern languages, and wrote poetry so exquisitely, that Coleridge praised it as superior to his own. In a word, she was formed to win all hearts, and she did win them.

“In politics she was a Whig. The Duke of Marlborough—the conqueror at Blenheim—was her grandfather, and his life was devoted to the vindication of the principles whose triumph caused the revolution of 1688. The family maintained the same principles, and, accordingly, when Charles James Fox stood forward as their champion, the youthful Duchess flung herself into the arena of polities to accomplish his return to Parliament by the electors of Westminster. This was in 1784. She, a high-born exclusive, mingled with the mob of Westminster, as a vote-canvasser for Fox, and it is recorded that her smiles gained for her favorite many a suffrage, which, to a less fascinating applicant, would have been refused.”—*English Paper.*

§ 938. Nor is the moral influence of personal beauty, confined to the female sex.—The annals of our race are full of instances, in which the bodily symmetry and comeliness of *men*, have raised them from humble obscurity, to the highest stations of human power, and enabled them to manage the affairs of kingdoms, as their passions or caprices instigated.—The history of the kings of England alone, affords us numerous instances of this kind, wherein men, without birth, without virtue, without learning, without political experience or skill,—in short, without any thing to recommend them but the symmetry and beauty of their persons, have become—for the sake of their bodily charms, solely, the special favorites of kings, and been elevated from humble life, to the highest honors of the state, next to the crown; and by their moral influence have wielded the authority of the crown, with as much power as if it actually encircled their own heads.—And, from the ruling favorite of a crown, down to the humble gallant of a neighborhood, the man of great bodily symmetry, and beauty, exerts a much more powerful and extensive moral influence, than those who are in all other respects his equals, but want his corporeal charms.

§ 939. And who will say that aught of this is evil?—and that it springs from the depravity of our nature?—Does it betoken human depravity, that we should be charmed and delighted with the harmony and the soul-stirring melody of music?—Or, that we should contemplate, with admiration and delight, the beautiful and the sublime of nature, in earth, and ocean and the starry heavens?—Whence spring the raptures of our kindled moments, when we contemplate the beauty and magnificence and grandeur and sublimity of nature, but from the soul's *perception* of the beauty and the harmony of truth? and from the soul's *conception* that the truth of

beauty and of grandeur and sublimity in nature, *is but the shadowing forth, in perceptible forms, of the infinite perfections of the invisible and ETERNAL MIND?*

§ 940. Who, in imagination, pierces the veil between eternity and time, and soars away to that pure world of happiness and glory, where, the good man hopes, when this probationary pilgrimage is done, to dwell in immortality of soul and endless bliss,—and contemplates the sanctified inhabitants of that holy place, risen incorruptible, to eternal life and everlasting glory with the Eternal One,—that does not see the glorified bodies of all the spirits of just men made perfect, as perfectly symmetrical and beautiful as those spirits are holy and happy?—Does not the natural harmony of things demand it?—Can we conceive of any thing deformed in heaven? or any want of perfectness in any thing there?—And what is heaven but *the supreme and perfect reign of all the laws of God, in every thing?*—It must be then, that, the perfection of the human body, is an essential part of the complete and perfect harmony of nature; (§ 929.) and that God, in the original constitution of things, established fixed and precise relations between the bodily, and the intellectual and moral perfections of man:—and between the bodily symmetry and personal comeliness, and the moral influence of man. (§ 935.)

§ 941. Some, it is true, contend that, as the horse and dog and many other species of the lower animals, and also, many species of the vegetable kingdom, are capable of being very greatly improved, in size and vigor, and symmetry and beauty, by being taken from their natural state, and cultivated by the care of man, therefore, analogy exceedingly favors, if it does not establish the conclusion, that, the human form was not originally so well developed—so large and vigorous and

symmetrical and beautiful as it has been rendered, and is capable of being rendered by cultivation in civic and artificial life. But this reasoning appears to be wholly inconclusive, and illogical.—It assumes as true what I am by no means prepared to grant.—I believe there is a general evidence in nature, that many species of the lower animals, if not all, and of the vegetable kingdom, as well as man, have undergone a considerable degeneration, since they were originally produced:—and this is at least, clearly implied, if it is not explicitly asserted in our Sacred Scriptures.—It therefore, remains to be proved that what is called the *natural state* and condition of the horse and other animals, and of the rose and other vegetables, is truly such; and not a degenerated state and condition: and consequently, it remains to be proved that they are really capable of being cultivated into a higher state of perfection than they originally possessed.* The general evidences and analogies of nature, certainly do not appear to favour such a notion.

* Those who have seen the horse in a perfectly natural state, in a climate congenial to his nature, speak of him as being superlatively beautiful.—It is undoubtedly true however, that in any species of organized bodies, either vegetable or animal, an individual of good health and vigorous constitution, may be more rapidly developed, and considerably increased in size, by means which, if continued through several generations, would inevitably deteriorate the race, and which would also necessarily increase the liability to disease in the individual in whom the experiment began; and in some measure shorten his life. “When a boy,” says my excellent friend Alvan Clark, Esq., “I planted a number of peach trees on my father’s farm. Some of them I planted in a very rich soil; and others in a drier, more sandy and poorer soil. In a few years, those which I planted in the rich soil, were fine large trees and began to bear; while the others were very backward and small, and seemed to promise little. In this state, I left them, and my native place. After several years’ absence, I returned home, and found that the trees which I planted in the rich soil were all dead and dry; but the others, which were so unpromising at first, had become noble

§ 942. But, admitting this opinion to be true, it does not follow that man—the highest order of terrestrial beings—endowed with intellectual and moral powers, and for whom, in one sense, all other things were made,—prepared to serve his natural and intellectual and moral wants, and designed to be subject to his husbandry and cultivation,—was, also himself, originally created, less perfect as an organic and animal being, than he was capable of being rendered, by artificial cultivation.—Certain it is, that what is now regarded as the *natural state* of man, affords no evidence for reasonings of this kind:—because the savage state, (§ 25. Note) such as it now exists, and such as it has existed for many centuries, and probably for several thousand years, (§ 778.) is, most indubitably, not the *natural state of man*. (§ 774.) We know that, many of the habits and circumstances of savage life, are very far from being natural to man, and powerfully serve to deteriorate his nature. (§ 653.) Yet, if it were true, that, the original, organic and animal nature of man, was capable of great improvement, in size and strength and symmetry and beauty, by cultivation; it would not, in any measure, militate against the doctrine, that, in the original design, and in the constitutional nature of things, the Creator established fixed and precise relations between the bodily, and the intellectual and moral perfections of man;—and between his bodily symmetry and beauty, and his moral influence.

“trees and were still in full vigor, and laden with delicious fruit.”—This is an excellent illustration of what is true in animals as well as vegetables.—Thousands of human beings are made to grow rapidly, and are kept plump and ruddy, by means which rapidly expend the resources of the vital constitution, and commensurately shorten life, and increase the danger of disease; and which, if continued in a direct line without interruption, through successive generations, would inevitably cut off the line in three or four generations at longest.

§ 943. But account for it as we may, it is a truth, the demonstration of which, we all have in our breasts, that, when we find a truly beautiful person, with intellectual and moral deformity, or, one of high intellectual and moral beauty, with a disagreeable or deformed person—whatever conclusion our education and our reasoning powers, may strive to lead us to,—we *feel*, and irresistibly, we feel that, in either case, there is a natural incongruity—a want of harmony!—Indeed, we *feel* it to be something of a mostrosoity!

§ 944. It is not that, the mere curves and lines, and complexion of the body, as material qualities, afford us this delight, in beholding the corporeal beauty of man,—but it is that, the truth of bodily perfection, harmonizes with the intuitive sentinent of every soul, that such perfection is the true bodying forth of intellectual and moral beauty.—We feel that, as an unseen energy controls the aggregation and arrangement of the particles of matter, and brings them into the perfect form of a beautiful crystal, so the efficient spirit of intellectual and moral beauty, should control the aggregation and arrangement of the matter of its bodily form, and make that body the true type of its own beauty and perfection.—And hence, whenever we behold a beautiful human form, concerning the mental and moral qualities of which, we are wholly ignorant, our admiration of it always, necessarily, involves the idea of the harmony of its mental and moral qualities with itself.—We inevitably admire it as the true form of the mental and moral beauty of its soul:—and, consequently, so long as we continue to be enamored with a beautiful person, we continue to believe that person possessed of a degree of intellectual and moral beauty, equal to the degree of our passion: (§ 586.)—and, when we discover that this is not

the case; and find that, with such a beautiful person, there is associated intellectual and moral imbecility or deformity, the beauty of the person, no longer excites our admiration; but the individual becomes the object of our pity or disgust or abhorrence.

§ 945. But, it is said that symmetry and beauty of body, serve no other end than to minister to the personal vanity of the possessor, and the delusion of the admirer; and therefore, it could not have entered into the design of the infinitely wise and holy Creator, to establish a fixed constitutional relation between the bodily symmetry and beauty of man, and his intellectual and moral excellence:—and between those bodily qualities and his moral influence!—It is true, that, in the miserably perverted and deranged state of things, in the present condition of the human world, personal beauty is too generally associated with excessive vanity; and too often with a vacant mind;—and not unfrequently with a vicious heart. But these facts conflict not with the sentiment which I have advanced. They only show that, those powers and qualities which God designed for good, may, by man, as a free moral agent, be abused and perverted, and made the means of evil. But, whether for good or for evil, still it is true that, all things else being equal, he or she that possesses the greatest personal charms, or bodily symmetry and comeliness, exerts the greatest moral influence upon others.

§ 946. There are many comparatively beautiful persons in society, who are still, not perfectly symmetrical in all their organization, and harmonious in all their proportions:—some want of development in particular parts, or some undue development of others, destroys the perfect symmetry and harmony of the system and causes a correspondent blemish in the intellectual or moral char-

acter, or both.—But where the symmetry is perfect and there is a complete harmony of all the parts, if the intellectual and moral beauty are not equal to the symmetry and comeliness of the body, it is entirely the fault of education, and not in any degree owing to the want of natural faculties or powers. Nor is there any more natural necessity for vanity, in connexion with personal beauty, than there is for any other folly or vice.—Yet the very fact that such people are vain of their beauty, is itself, a proof of the moral influence of bodily symmetry and comeliness!—How else, should a beautiful person become vain of his or her bodily charms, except by the continual experience that, every one admires and praises, and shows a deference to those charms?—But were bodily symmetry and comeliness as common as they are now rare, the grounds of this vanity would be done away;—all would admire those qualities as much as we now do:—yet the few could not pride themselves in a monopoly of those attributes which they considered would secure them all the favor and admiration they desired, without the addition of intellectual and moral beauties, because they only possessed them:—but knowing that personal charms were the common endowments of their fellow creatures, they would feel the necessity for proper intellectual and moral cultivation, to secure their welfare and their happiness.—And if, by proper cultivation, their intellectual and moral excellence became equal to their bodily perfection, they would be living illustrations of our ideas of angels; and their moral influence would be almost omnipotent in the cause of virtue; refining, chastening, elevating all on whom it was exerted, and by whom it was felt!—And this would be a fulfilment of the design of the Creator, in the original constitution of man and things.

§ 947. If it be true then—and we cannot justly doubt its truth,—that the infinitely wise and benevolent Architect of Nature, ere he had called the substances and forms composing the material universe into existence, conceived with all the perfectness of the Eternal Mind, the nice design of each particular form he was about to order into being, with a determinate regard to its own *final cause* and its relations to all other forms, and in that perfect conception of the scheme of nature, the Omnipotent Mind, as it were, pencilled out in its imagination, the human form with fixed and precise regard to all its attributes of body and of soul,—and if it be true that the Creator perfectly bodied forth the conceptions of his mind in the material form of man, and thus made the first parents of our species the exact images of his thoughts and the perfect models of their kind:—and, with determinate reference to the general harmony of things, established in the constitutional nature of man, fixed and precise relations between his corporeal and intellectual and moral perfection, (§ 927.)—and between his bodily symmetry and comeliness and his moral influence: (§ 935.)—and established also in the constitutional nature of man, an economy by which like beings, in nature, size, symmetry and beauty were to be propagated through succeeding generations, during the existence of the species,—and if the results of that economy as to the size and symmetry and beauty of the human body, may be greatly modified by the voluntary actions and habits and conditions of mankind,—then it is manifestly our natural and moral and civil and religious duty to cultivate, by all true and proper means in our power, the bodily symmetry and beauty of our species.

§ 948. They who have thought little on this interesting subject, may perhaps, feel disposed to smile at reasonings

of this kind:—yet if they will give their attention thoroughly to the matter, they will find that these views are not chimerical, but that they are founded in the deep philosophy of things.

§ 949. The apostle Paul involves the same idea in his beautiful illustration of moral and spiritual things.—He tells us that the highest good of man, as well as the glory of God, requiring that man should be perfectly reconciled and conformed to God, the Eternal Father, in order to adapt his economy of grace—designed to effect this glorious end of salvation—to the nature and condition of man, and to show man precisely and truly what he must be reconciled to, spiritually and morally bodied forth, in Jesus Christ, the exact image of himself,—and predestinated that all his children should be conformed to the image of his Son.

§ 950. The beautiful idea is that, the Father delineated the exact image of himself in Jesus Christ, as a perfect model of a child of God, and established an economy of grace by which, all that were begotten of God should be born in the image of his Son—being moulded after the perfect model,—and should grow up in the exact likeness of that model, till—as they had naturally borne the image of the earthly man Adam so they should morally and spiritually bear the image of the heavenly man Christ;—and attain to the measure of the fulness of his stature,—or, morally and spiritually become in size, symmetry, comeliness, and in all other respects exactly like him.—And God having established this perfect model, with fixed and precise relations to himself, and to the nature and condition of man, and predestinated that all his children should be conformed to it; and having established an economy of grace by which man may become conformed to that image; and the results of which, man,

as a free moral agent, can greatly modify by his voluntary actions, habits and conditions, the apostle earnestly exhorts and entreats those whom he addressed and all mankind, to use all their powers and means to become conformed to that perfect image of God in Christ Jesus, and thus to work out their own salvation with earnest solicitude and perseverance, and secure their own highest and eternal well-being and make their calling and election sure.

§ 951. But I hope that I shall not be misunderstood on this subject.—In advancing the proposition that, it is our natural and moral and civil and religious duty to cultivate, by all true and proper means in our power, the bodily symmetry and beauty of our species, I do not mean that we are to do this merely for the sake of bodily symmetry and comeliness; but because, in the constitutional nature of things, these corporeal attributes hold such a relation to all the other qualities of our nature, that the perfection of our whole nature requires such a cultivation of these attributes: (§ 940.)—and precisely those measures which are best adapted to produce and preserve bodily symmetry and comeliness, are also most favorable to all the vital interests of our bodies, and to our highest intellectual, and moral, and social, and civil, and religious welfare. (§ 678.)

§ 952. The various attributes of our nature, are, like the commandments of the Decalogue, so essentially one, that he who offends in one, offends in all.—We cannot violate nor neglect those physiological interests which are connected with our bodily symmetry and comeliness, or with the perfect organization, and symmetry and harmony of our whole corporeal system, without violating or neglecting those interests which are essential to the highest and best condition of our whole nature. (§ 613.)

So that, if our sole object were to attain to the highest intellectual and moral excellence of which our human nature is capable,—if the means whi h we used to gain our object, were, in all respects, most truly and perfectly adapted to the end which we aimed at, they would also be best adapted to produce and preserve the most perfect bodily symmetry and comeliness; and would be most favorable to bodily health, strength, and longevity. (§ 678.) Hence I affirm that it is our natural and moral, and civil and religious duty to cultivate by all true and proper means in our power, the bodily symmetry and beauty of our species.

§ 953. And surely, to say the least of it, there is quite as much reasonableness in our endeavoring to cultivate the bodily symmetry and comeliness of our own species, as there is that we should cultivate these qualities in the lower animals.—Many think no trouble and expense of time and money too great to be devoted to the cultivation of the bodily symmetry and beauty of their horses and oxen and cows, and even of their swine and domesticated fowls, and other animals:—but no one seems to think it of any importance to cultivate these qualities in the human species,—though the common sense of every man that reflects a little on the subject, must enable him to perceive that all the constitutional interests of our nature, are to some extent, connected with these corporeal attributes.

§ 954. Omnipotent Fashion with most capricious, and yet most absolute and imperative authority, defines and ordains for us, the shapes and forms that we must worship, and to which we must become assimilated,—however unfriendly to the physiological and intellectual and moral interests of our nature!—If the body and limbs can be compressed or stretched into the mould of fashion,

it is of little consequence whether they possess any natural symmetry or not.—If the garment is shaped exactly according to fashion, and the body can be squeezed into it, it is no matter how much deformity that garment hides.—If the waist is too large, it must be reduced by the tournequet of fashion:—if the shoulders or other parts are not sufficiently broad or prominent, they must be filled out by padding and buckram:—and thus, human beings are tortured into such shapes as despotic fashion capriciously chooses to assume as the models of gentility and elegance;—and, unfortunately for poor human nature, almost every one of the caprices of fashion, is seriously unfavorable to our physiological, intellectual and moral well-being:—and the very means which fashion takes to make us artificially beautiful according to her ever changing standard, are directly calculated to destroy the natural symmetry and comeliness of our bodies, and to make us ugly and deformed. So that, by the operation of these, and other causes, there is little real bodily symmetry and comeliness to be found among the present generations of the human race:—and what little there is, is mostly to be found among those tribes which are not considered as within the pale of civilization and refinement, or which, at most, have not advanced beyond that simple state, which, in all time, has been called the “golden age;” (§ 648) and whose habits and circumstances most nearly accord with the constitutional laws of human nature.

§ 955. It is truly surprising how very rarely bodily symmetry and comeliness are to be met with, in civic life!—If we make it a matter of particular attention, we shall find that hundreds of the fashionable and genteel and elegant ones of society, may pass in review before us, without affording one instance of real beauty:—and

in a thousand, we may not be able to find one, who is even moderately symmetrical and beautiful throughout.—For, it often happens that we find a tolerably pretty face belonging to a body possessing no natural symmetry:—but a fashionable dress can make up for this defect, sufficiently to answer the ends of fashion—the mutual deception and fraud of civic life.—And how frequently do we see, moving before us, an artificially manufactured figure, which fills our imagination with the idea of all that is enchantingly beautiful in the face belonging to that form, which is covered from our curious and eager gaze by an envious hood or bonnet:—yet if an unlucky turn presents that countenance full to our eye, it is like the disclosure of the visage of the veiled prophet; we feel a deep and powerful revulsion of the soul, and almost instinctively recoil from the reality of our visual perception, which, at once, dashes the spell of our imagination and our sensibilities, and forces upon us the sudden and painful conviction of our delusion.

§ 956. The artificial symmetry and comeliness of civic life, may enable us to hide our natural deformity, and deceive others, till we can get married, but they do not fit us to become the parents of symmetrical, and comely and healthy offspring, and thus—so far as we are concerned—to bless the world with a symmetrical and beautiful and noble race of human beings;—such as God made man to be, in the highest and best condition of his nature:—and such as God has made man capable of being if he will:—but not without a strict conformity to those laws of constitution and relation which are wisely and benevolently established in his nature.

§ 957. Organization, as we have seen, (§ 121.) being the result of the vital action of living organs, and all organized bodies deriving their existence from pre-exist-

ing bodies of the same kind, living organized bodies in a perfect state, possess a constitutional economy, by which they can produce other organized living bodies like themselves, in all respects, (§ 125. 133.) unless the operations and results of that economy, are affected by disturbing and modifying causes, distinct from its original constitutional laws.—When all the constitutional laws of that economy are perfectly obeyed, its results will nicely correspond with the design for which it was established,—or perfectly resemble the original type or model in which the Creator instituted that economy, with fixed and precise relations to all the physical, mental and moral faculties, attributes and powers of that model:—but all infractions of the constitutional laws of that economy, necessarily disturb its operations, impair its powers and modify its results. And as all living bodies are capable of being deteriorated and afterwards improved, so the reproducing economy of living bodies, is affected by their condition, and its results correspondently modified. Hence, certain causes acting on the human species, through several generations, will exceedingly degenerate the race, and establish those peculiarities in tribes and nations, which will give the appearance of strongly marked varieties, if not of distinct species of the human family.

§958. It is important to remark, however, that in the earliest generations of the human species, when the constitutional powers were least impaired, and all the vital susceptibilities and sympathies of the system most delicate and vigorous, all disturbing causes would produce more powerful effects in the physiological operations and results of the vital economy, than when the system had become more deteriorated or depraved in all its properties.—Thus as we have seen, (§ 706.) when all the

organs are pure and undepraved, the presence of baneful odors will not only be perceived by the olfactory sense, but if their quality or power be such as to endanger the vital welfare of the system, the alarm will be given through the medium of the vital sympathies, to the whole domain of organic instinct; and every part will be called into vigorous, and perhaps violent action, to protect the vital interests:—and in the general array of all the vital powers against a common enemy, the particular functions of the several organs, are necessarily more or less disturbed.—So when a state is invaded by a foreign foe, the husbandman, and artisan and merchant, and other members of the commonwealth, roused by a common sympathy of patriotism, rush to the field of arms to protect the common interests of the state; and by these means, the particular functions of these several men, in agriculture, arts and merchandise, upon which the very existence of the state depends, are necessarily, more or less disturbed: and if these disturbances are too powerful, too frequent or too long, famine and poverty, and pestilence and general ruin must result.

§ 959. But when the vital sensibilities and sympathies of the organs, have become depraved and generally impaired, the poisonous odors, though equally hostile to the vital interests of the system, are not perceived and appreciated by the olfactory sense, (§ 706.) and consequently no alarm is given and no general effort is made to resist the encroachments of the enemy; but the whole system stupidly succumbs, and gradually sinks and perishes beneath its baneful influence; and the unhappy subject never, perhaps, suspects the cause of his destruction. Or, if from the potency of the disturbing cause, the particular organ upon which it more immediately acts, is somewhat irritated, the vital sympathies

of the system are too much depraved to communicate the alarm with integrity, and all the physiological powers of the body, are too much impaired to admit of a prompt and vigorous co-operation of the several parts to resist or to expel the invading foe. (§ 707.)

§ 960. In the same manner, when the system is in a perfectly healthy and pure state, if any substance, unfriendly to the vital interests, be taken into the gastric cavity, the organic sensibility of the stomach (§ 737.) will instantly detect its pernicious character, and not only will the stomach itself be disturbed, but it will promptly give the alarm through the medium of the healthy sympathies, to the whole domain of organic instinct, and all the vital powers will at once, be arrayed against the hostile invader; and act with an energy and violence proportionate to the real banefulness and power of the disturbing cause. And perhaps in the mighty conflict, life will be exhausted, and death ensue, before the enemy can be expelled, and the system relieved from its destructive influence. Yet in such a case, death would be more the result of exhaustion than of poison. (§ 885.) But, when the physiological powers of the system have become generally depraved and impaired, pernicious substances may be introduced into the stomach habitually, and that organ will not detect their poisonous character, (§ 738.) nor spread the alarm over the domain of organic instinct; and, while a morbid irritation injurious in its effects will be more or less extensively felt, there will be no array of the vital powers against the invader, (§ 739.) but the poison will be permitted to extend its ruinous influence into every part and substance of the whole system;—the functional results of every organ will be deteriorated, and the constitution slowly impaired, and life destroyed. And perhaps, through the whole progress of the work

of death—except in the agonies of the first debauch—the sensibilities and sympathies of the system will scarcely indicate a struggle of the vital powers to arrest the career of the destroyer!—so completely will they be stupefied and subdued by that destroyer's influence. In such a case, death is truly the result of poison.—Or, if the disturbing cause is very powerful, the morbid irritations of the organ immediately acted on, will be extended over the system, by unhealthy sympathies, and there will be a blind array; and violent action of the vital powers, which, instead of relieving the system, will only increase its sufferings and hasten its destruction; and in these terrible conflicts, such a system will exhaust its vitality, and death will result much sooner than in a healthy body.—So, when a state is generally depraved, by the universal selfishness and sensuality of the people, the constitutional interests of that state may be assailed and gradually destroyed; and none will have the courage nor the inclination to rise in the cause of freedom and of patriotism; but all will stupidly submit to the encroachments of usurpation, and suffer their liberties to be continually abridged, and themselves degraded to very slavery:—and when oppression bears so heavily upon them, as to be intolerable even to a slave, they will groan under it as under an incubus, which by the very principle that gives distress deprives them of the ability to act.—Or if they should be goaded on to action, it will only be in blind and violent convulsions, without direction—without aim,—and their tumultuous struggles will only serve to exhaust and to destroy themselves, or sink them deeper in their miseries, without effecting any good for the cause of freedom and the rights of man.

§961. But when I say (§958.) that, in the early state of the human constitution, when its physiological powers

were far less impaired, and all the vital susceptibilities and sympathies of the system, far more delicate and vigorous, all disturbing causes would produce more powerful effects in the physiological operations and results of the vital economy, than when the system had become, in all its properties, more deteriorated or depraved, I do not mean that in the most healthy and vigorous state of the human constitution, disturbing causes more readily and more easily induce disease and death, but that all the vital powers, according to the instinctive economy of organic life, more promptly and more powerfully and more determinately co-operate to resist the action of those causes which are unfriendly to the vital interests:— and therefore, disturbing causes acting on particular parts, more powerfully affect the physiological operations and results of parts not immediately acted on by these causes, but sympathetically affected by them. Thus, if a piece of tobacco is taken into the mouth of one whose system is in perfect and vigorous health, and whose physiological properties and powers are perfectly undraped and unimpaired, the poisonous character of the tobacco will be instantly perceived by the vital sensibilities of the parts on which it acts, (§ 296.) and the alarm will be promptly given to the whole domain of organic instinct, and the physiological operations and results of the stomach, the liver, the lungs, and every other organ in the body, will be more or less powerfully and extensively affected, by the sympathetic irritations of the system (§ 300.) and by the general effort of the vital powers to resist the poisonous effects of the tobacco, and to expel the enemy from the vital precincts. But, when the system has become depraved, and its physiological properties and powers impaired by the habitual use of tobacco, its poisonous character is not detected, no alarm is given

to the domain of organic instinct, and while the vital interests are continually injured, and life itself jeopardized by the habitual presence of the poison, no general and energetic effort is made to resist its action, and consequently, the physiological operations and results of the stomach and other organs of the body, are not at any time, so powerfully affected by the tobacco; though they are continually suffering, to some extent, from its deleterious influence.

§ 962. Hence, therefore, when the physiological properties and powers of the human system, are in the most perfectly healthy and pure and vigorous state, the disturbances of one special economy of the system, will most powerfully affect the physiological operations and results of another special economy.—Moreover, in such a state of things, the extent to which the physiological operations of the system, deviate from normal results, under the action of disturbing causes, must always be proportionate to the force of the disturbing cause, and the physiological power of the disturbed economy.

§ 963. It therefore, clearly and necessarily follows, that the greatest deviations from normal results in the reproducing economy of the human system, could only be effected by the influence of disturbing causes, in the early generations of the human species, when the constitutional powers were little impaired, and all the vital susceptibilities and sympathies of the system still nicely delicate and vigorously active.—Abortive and puny and deformed results are infinitely more numerous in the more degenerate state of the constitution: but great deviations from the regular results of the economy, and enormous monstrosities are only to be expected from the disturbances of the most vigorous physiological powers.

§ 964. It is also a fact of great interest and importance

to the subject before us, that in the primitive generations of the species, when the human constitution was little impaired, and the physiological properties and powers of the system comparatively little depraved, the direct effect of mental and moral influence on the reproducing economy, (§ 303.) was vastly greater than at present.—Besides, in the earlier period of the world, when the inhabitants of the earth were few, they divided themselves off into families, and formed separate tribes; and, as a general fact, for many centuries, the members of each tribe formed matrimonial connexions only with their own tribe, or very rarely with members of other tribes:—and the separation and distinctness of the different tribes, were still further secured by the peculiar religious views and institutions of each tribe. Consequently, the strongly marked variations of the reproducing economy of the human system, in single instances, in that period, would almost of necessity become the heads of separate families, which would grow into separate tribes, and, in time, into separate nations; and thus, the original peculiarities of the variations, would naturally and inevitably be preserved—and perhaps increased by peculiar habits and circumstances, in tribes and nations through all succeeding time, unless a complete amalgamation, of all the different tribes and nations in the earth, should be effected:—and this, natural affinities and many other causes would conspire to prevent.

§ 965. These principles and facts, together with what may properly be allowed for the effects of climate and other circumstances, and also, the peculiar habits of different families and tribes, are quite sufficient to account for all the varieties of the human species, at present existing on the earth; and also, to afford a satisfactory reason why those varieties may be traced back to very

early ages. Indeed, if those varieties had not originated in the earliest ages, it would have been extremely difficult for them to be preserved. For, as the earth becomes more densely populated, and the borders of one nation fade into those of another;—and the artificial wants of civilized life are greatly multiplied, and lead to the extensive intercourse of nations, it is extremely difficult, if not impossible for one individual to become the progenitor of a separate and distinct nation or tribe. And as the general improvements of civilization increase and become extended;—and yet more especially, as a more truly rational and enlightened religion prevails, every thing tends more and more powerfully, to a gradual obliteration of all national distinctions and peculiarities, and to a universal blending of all the different portions of the human family into one great and harmonious fraternity!

§ 966. It is therefore, with the strictest regard to the physiological principles and powers of the human system, and to those effects which, from the constitutional laws of things, would almost necessarily result from the action of disturbing or modifying causes, in different conditions of the human constitution, that I confidently affirm the truth of the position, that, the most strongly marked varieties of the human species, sprung from one and the same original stock, in the very early periods of the existence of the species: and that, by the natural affinities and repellances of human taste, these varieties were originally separated from each other, and preserved and strengthened in their peculiarities by the long continued operations of a variety of causes.

§ 967. It is well known that, in several species of the lower animals varieties quite as strongly marked as any in the human species, have been effected by the modify-

ing influences of cultivation, climate, &c.—In a pure state of nature, great uniformity in color, size and shape pervades the whole species: but when any species of animals comes so far under the control of man, as to have the condition and operations of its physiological powers considerably affected, strongly marked variations from the truly normal results of the reproducing economy, very soon take place; and the different members of the species soon become of all varieties of color, and vary greatly in size, and very considerably in form. It is so common for entirely black lambs to spring from parents both of which are entirely white, that it is no longer a matter of remark; and no one thinks of denying the fact nor of attempting to prove that such a thing cannot be. Yet we frequently meet with most elaborate tissues of reasoning and speculation against the possibility of such results of the reproducing economy of the human species, in any condition of its physiological powers, or in any state of the human constitution. But these objections all appear to be founded on quite too partial and too limited views of things. The objectors do not seem to contemplate nature in the wide range of her normal and abnormal capabilities, nor fully to appreciate the difference of the effects of similar causes, in different states of the constitution, and different conditions of the physiological properties and powers of the human system.

§ 968. We have seen (§ 697.) that there are the most precise and determinate relations between the organs and functions of the human body, and the nature and condition of human aliment; (§ 698) and it is equally certain that there are the most precise and determinate constitutional relations between the economy of nutrition and that of reproduction in the human system.

§ 969. In order that living bodies, in their original

state and condition, should produce their like (§ 927.) in perfectness of organization, size, symmetry, beauty, &c. it is necessary that the laws of constitution and relation should be exactly fulfilled in those bodies; and in order that the results of the reproducing economy of the human system, should come up to the original model of our species, it is only necessary that the original laws of constitution and relation should be exactly and permanently fulfilled.

§ 970. The causes which modify and deteriorate the results of the reproducing economy in the human system, are many and interesting; but it is more particularly our present business to inquire into the influence of diet on these results,—and, if possible, to ascertain the comparative effects of animal and vegetable food in modifying them.

§ 971. The interesting question (§ 512.) now recurs and demands solution;—Since the economy of nutrition sustains the growth of the body from birth to adult age, why, by the same economy, does not the body continue to increase in size so long as its life continues?—or what limits the dimensions or establishes the determinateness of the development of living bodies?

§ 972. In regard to individual cases, as a general rule, the ordinary results of the reproducing economy, as to size, definition, proportions, &c. of the body, greatly depend on the peculiarities of constitution, the physiological condition and the general organic economy of the immediate parents.*—But as a general physiological law

* Peculiarity of size and shape often runs in particular families through several generations: and where those families become separated from the rest of the species, and intermarry among themselves and originate separate tribes, as in the early periods of the world, (§ 964.) these peculiarities will be perpetuated for centuries; and especially if they be

of the species, the development, proportions, size, symmetry, and termination of growth, as well as the natural termination of the life of the human body, are unquestionably connected with the relative proportion and conditions of the solids and fluids in the system. (§ 684.) —Whatever changes the relative conditions of the solids and fluids from the true constitutional character, necessarily impairs the processes and results of the vital economy; (§ 690.) and whatever changes the relative proportion of the solids and fluids, more rapidly than is strictly consistent with the physiological interests of the system, necessarily produces similar effects. (§ 691.) —When the relative proportion and conditions of the solids and fluids, by whatever cause, are brought into a certain state, the growth ceases, whether the body is fully developed in size, proportions and symmetry or not:—and when this effect is produced by greatly hurried and imperfect processes in the physiological operations, from the action of disturbing or irritating or even too accelerating causes, the results will be commensurately imperfect and perhaps deformed. (§ 924.)

§ 973. It is from this physiological law that the use of

of a character which is favored by the situation and habits of the people. And even in the midst of other society, and without any exclusiveness of marriage connexions, such peculiarities are often preserved in particular families for three or four generations. "In Samson county, North Carolina," says the Rev. Thomas P. Hunt of that State, "the people generally, are above the ordinary size and several families are remarkably large. One family of the name of Murphy has six or seven sons measuring six feet and six inches, and one of them measures six feet and seven inches. Another family by the name of Holmes is equally remarkable for stature. Twelve young men of this family weighed thirty-two hundred and seventy-five pounds. A family by the name of Preston in the western part of Virginia exhibits the same giant size of body."

opium and other substances in the mother, often dwarfs and deforms the offspring: and it is upon this principle, that excesses in particular vices in early youth, often prematurely arrest the growth of the body, and bring on an untimely old age and early decrepitude and death.

§ 974. Now then, from the constitutional laws and relations of the vital economy of the human body, which have been fully explained, in reference to the subject before us, (§ 884.—973.) it must be clearly evident that animal food—or flesh-meat cannot be so conducive, as proper vegetable food, to the perfect development, symmetry and comeliness of the body.—Because, animal food, possessing a greater proportion of stimulating power to its quantity of nutrient matter, (§ 916.) more rapidly exhausts the vital properties and wastes the substance of the organs, (§ 919.)—and accelerates all the functions of the system and renders the vital changes less complete, and the general results of the vital economy less perfect. (§ 924.)

§ 975. There is no law of organic life, extending over the whole animal and vegetable kingdoms, which is more general and more certain than this. The slower the growth of organic bodies, consistently with the perfectly healthy and vigorous condition and action of the vital powers, the more complete are the vital processes, and the more perfect and symmetrical is the general development.—Indeed, this law, or one very analogous to it, extends throughout the material world, and governs the formation of all material bodies. Even the crystals of the mineral kingdom which are formed most slowly, and, as it were, in the undisturbed tranquillity and serenity of nature, are the most perfect and the most beautiful.

§ 976. In the vital economy of the human body, we have seen (§ 916.—926.) that all the changes concerned

in the nourishment and development of the system, are the most healthfully slow and complete (§ 746.) when the food is purely vegetable; and it therefore, must follow from every known physiological principle in the human constitution; that, all other things being equal, a pure and well-chosen vegetable diet is most conducive to completeness of bodily development, and perfectness of symmetry and beauty. (§ 940.)

§ 977. In illustrating these principles from the history of the human species however, a thousand difficulties, as we have seen, (§ 882.) lie in our way, which require the exercise of the most constant and cautious and rigorous inspection, to prevent our being betrayed into the apprehension of erroneous facts, and led to false conclusions. (§ 897.) For in a cursory survey of the extended history of man, we meet with innumerable phenomena which are in the highest degree calculated to deceive us. (§ 912.)—We find perhaps, many living mostly or entirely on vegetable food, who are far from being well-developed and symmetrical; and we seem to be forced to the conclusion that vegetable food is by no means favorable to the most perfect development of the human body. But it is entirely certain that if we examine such cases with close and severe and thorough scrutiny, we shall find in the condition, circumstances and habits of such people, causes more than sufficient to account for all the apparent contradiction between the physiological principles which I have explained, and the phenomena presented by such cases. (§ 776.—778.) Again, we find perhaps, many subsisting mostly or entirely on animal food, who are large in size and at least quite as symmetrically formed as most other portions of the human family. Here again we seem forced to conclusions adverse to the physiological principles which I have

advanced. But here again, a full and accurate investigation of the matter, will clearly show that there are no real facts in the case, which are not perfectly consistent with the principles contended for.—Nay, indeed, the more extensively and rigorously we push our researches and investigations, and the more clearly and distinctly we ascertain the truth, the more fully shall we be convinced of the accuracy of those principles.

§ 978. Ancient history gives us accounts of a few tribes scattered over Europe and other parts of the earth's surface, and situated mostly upon the borders of seas, rivers, &c. who subsisted mainly or entirely on flesh or fish, or both. But we are not sufficiently well informed concerning them to draw any safe conclusions from any known facts which their cases present. We are therefore, obliged to take our illustrations from those authentic, detailed accounts of tribes and nations subsisting mostly or entirely on animal food, which are of a much more recent date. The celebrated voyager Captain Cook is one of the earliest and most valuable sources of information on this interesting subject, of modern times; and since him, many enterprising voyagers and travellers have corroborated his statements, and very greatly extended our means of information.

§ 979. Professor Lawrence, who probably eats flesh himself, and who is willing that every body else should eat it, and therefore is neither by theory nor practice interested to decry the use of animal food, yet being willing as a public teacher of physiological science, to avow what he believes to be true, frankly acknowledges (§ 859. Note) that, “the Laplanders, Samoides, Ostiacs, Tungoooses, Burats and Kamtschadales, in northern Europe and Asia, as well as the Esquimaux in the northern, and the natives of Terra del Fuego, in the

southern extremity of America, although they live almost entirely on flesh, and that often raw, are the smallest, weakest and least brave people of the globe."

§ 980. Dr. Lamb, of England, whose experiments and researches on this subject have been very extensive, has collected and published a great number of valuable facts concerning the effects of vegetable food in chronic disease, and the comparative effects of vegetable and animal food in the development of the human body. From an interesting work of his, which has recently fallen into my hands, I shall borrow largely for the illustration of those physiological principles which I have advanced in relation to the subject before us.

a. "The Laplanders subsist principally on animal food; and we are informed by those who have travelled and resided among them, 'that they are feeble, awkward and helpless beings.' "

b. "The inhabitants of the Andeman Islands, situated in the Pacific Ocean," says Dr. Lambe, "practise no sort of agriculture;—they inhabit the coast;—their only vegetable food is the scanty produce of the woods;—but their principal subsistence is drawn from fish—shell-fish, and the animals they catch in the woods. They seldom exceed five feet in stature, their limbs are disproportionately slender and ill-formed, with high shoulders and large heads: their aspect is extremely uncouth."

c. "The Ostiacs are the Tartar tribes inhabiting the regions watered by the Obi. They subsist mostly by fishing; though a portion of their food is the produce of the chase. 'The greater number of them,' says Pallas, 'are rather below the middle stature. They are not strong:—the leg is particularly thin and with a small calf. Their figure is, in general, disagreeable; and the complexion pale, without any characteristic trait.' "

d. “The natives of Van Dieman’s Land and of New Holland, subsist chiefly on flesh and fish. They are disproportioned in their limbs and in other respects, and have less strength than Europeans.”*

e. “The natives of the coast of New Holland are,” says Mr. Goldsmith, “perhaps the most miserable of the human species.”†

f. “The tribes on the coast of Terra del Fuego, have a very scanty supply of vegetables, but subsist mainly on fish and some flesh. ‘Their shoulders and chest,’ says Foster, ‘are large and bony;—the rest of their body is so thin and slender, that on looking at their different parts separately, we could not persuade ourselves, that they belonged to the same individuals. They are a short, squat race with large heads;—their color yellowish brown,—their features harsh,—their faces broad,—their cheek bones high and prominent,—their nose flat,—their nostrils and mouth large, and the whole countenance is without meaning. They are remarkably stupid. Besides fish, there is the greatest abundance of birds and animals which gain their food from the ocean. Some of the islands are absolutely covered by these animals, which may be killed in any numbers, with greatest ease: and if animals such as these, were proper food for man, these islanders would be rioting in abundance and luxury. But, instead of this, they are very few in number; and as Captain Cook says, a little, ugly, half-starved race.”‡

§ 931. The Indians of Patagonia, and of the great Pampas or plains of South America, (§ 788.) seem to form the most remarkable exception to the general rule in regard to flesh-eating tribes and nations. The earliest accounts which we have of the Patagonians, describe them as

* Lambe’s Reports, pp. 204, 205. † Manners and Customs of all Nations. ‡ Lambe’s Reports, p. 207.

almost a race of giants;—some of them measuring ten or eleven feet, and being, on the average, much taller than any other known portion of the human family, and every way well proportioned. These accounts however, are undoubtedly great exaggerations, and very far exceed the truth. But admitting that much which has been said of them by different voyagers and travellers which have been among them, is true, they are far from constituting a very strongly outstanding fact against my theory. It is unquestionably true that these people have subsisted mainly on flesh ever since they have inhabited Patagonia, and it is unquestionably true that they are as a race, much larger and more symmetrical than any other known tribe of flesh-eaters: and perhaps, on an average, larger than the Hindoos who live on vegetable food. So far then, the facts in the case, seem to be against the doctrines which I have advanced. But let us examine the matter further. If any dependence can be placed on the opinions of those who have written and testified concerning this people, the Patagonians originally sprung from a race of islanders of very great bodily size and harmony of proportions, and who were strictly vegetable eaters. If this is true, it would naturally require a succession of several generations under the most unfavorable circumstances and diet of savage life to degenerate the race to the diminished size of other flesh-eating tribes. (§ 972.) But such has not been wholly the case with the Patagonians. In the first place, the climate of Patagonia is exceedingly mild and uniform, and the atmosphere is very dry and salubrious. These things are in the highest degree favorable to the full and symmetrical development, and health and vigor and longevity of the human body, and to the multiplication of the species. In the second place, their children nurse long, and wear no clothes till

they are twelve or fifteen years old; and as soon as they are of sufficient age and size, they engage in the sports of childhood,—running,—exerting the upper limbs,—riding on horseback, &c. These things are all of them, likewise, in the highest degree favorable to the full and symmetrical development of the human body. The adult Patagonians perform little or no servile labor; but the food on which they subsist, is sufficiently scarce and difficult of attainment to require a very considerable degree of physical and mental exercise. They ride a great deal on horseback and indulge much in social amusement.—They have been taught by civilized man, to love tobacco and intoxicating liquors, but are very rarely able to indulge themselves in the use of these pernicious substances;—certainly not enough to produce any general and permanent physiological effect in their bodies, worthy of consideration. They use no other pure stimulants. (§ 743.) Their food is perfectly plain and simple. They mount their horses, pursue and take their game and return with it to their tents, where it is slightly cooked, either by roasting or boiling, and eaten. The animals on which they subsist (§ 923.) contain no fat, and therefore the Patagonians live wholly on the lean flesh of wild game, which is the healthiest kind of flesh-meat that can be eaten.

§ 982. With the exception therefore, of the bare facts that, the Patagonians subsist on flesh and are not careful to keep their bodies clean, every thing in their condition and circumstances, and nearly every thing in their habits, are decidedly and highly favorable to the full development and perfect symmetry of their bodies; and consequently, if flesh-meat were favorable to the physiological interests of the human body, the Patagonians must

naturally have at least, retained the size and symmetry of their progenitors. But after making a liberal allowance for the-exaggerations of the earliest accounts of the Patagonians, it is very evident that they were a much larger and better formed race when first discovered, than at present. For they have always been described by those who first went among them, as a gigantic race of people. But according to the testimony of Messrs. Armes and Coan, the American missionaries who have recently spent three months among them, the present inhabitants of Patagonia, fall very considerably short of the descriptions given of their ancestors some two or three hundred years back. They are still a tall and tolerably well formed people; but the missionaries found on measuring the very tallest of them, that they did not exceed six feet and two inches in height, and few of them came up to this. "They are evidently," says Mr. Armes, "a degenerated race of men and are still becoming more degenerated."

§ 983. The whole truth then concerning the Patagonians seems to be plainly this. They sprung from a race of gigantic and well formed vegetable-eaters,—they have always inhabited a mild climate and lived in a dry and salubrious atmosphere; and all the circumstances of their lives and nearly all their habits have been highly conducive to the full development and the symmetry of their bodies. Yet, in spite of all these advantages, they have in consequence mainly if not entirely, of living exclusively on flesh, gradually degenerated in size and symmetry:—for although they are still tolerably well formed, yet there is among them none of those perfectly symmetrical and beautiful models for statuary which are common among vegetable-eaters in the rude state of life.

§ 984. In contemplating the effect of pure vegetable

diet in the development and symmetry of the human body, it is necessary, as I have repeatedly remarked, (§ 882. &c.) to be exceedingly on our guard lest we be deceived by the numerous disturbing and modifying causes which almost universally operate in the various conditions of mankind. (§ 778.)

§ 985 As we have already seen, (§ 779.) all the ancient histories and traditions of our species, inform us that vegetable substances constituted the whole food of the primitive inhabitants of the earth: and that the human race at that early period, were exceedingly vigorous, athletic, of full development and symmetrical. I am however, by no means inclined to assert and vindicate the notion, that our first parent, when compared with the present inhabitants of the earth was a huge giant, nor that his immediate posterity were of mammoth size. There may have been, in the earliest generations of our species, when the physiological powers of the human body were most vigorous and least impaired, some wonderful monstrosities in size, as well as in other respects, produced by some of the freaks of nature, under the action of disturbing causes peculiar to those times. (§ 963.) Nor does the fact that no such mammoth remains of man have been discovered, prove that no such mammoth forms of man ever existed. Neither, as we have seen, (§ 941.) does the fact that other animals, found in what is commonly called a state of nature, may often be considerably improved in size and symmetry and many other qualities by cultivation, afford the unequivocal evidence of analogy that the original size and symmetry of man were such as to admit of considerable improvement by cultivation:—because, with very few exceptions indeed, if any, it is a matter of entire uncertainty whether any of the animals at present inhabiting the earth's surface, are truly and

perfectly in their original state of nature. The horse for instance, had originally some native spot, whose climate and soil and productions were best adapted to the physiological interests of his nature. If therefore, the horse species become dispersed over the globe, climate and other circumstances, must necessarily so affect their physiological powers, as in time, considerably to diminish the size and impair the symmetry and other qualities, of different portions of the species, and thus produce strongly marked varieties of the same species. If then, we take some of the most degenerate varieties of this species of animals, and, by cultivation greatly improve their size, symmetry and other qualities, the fact affords no unequivocal evidence of analogy that the original form of man admitted of similar improvement.

§ 986. I do not pretend to know, nor shall I contend that, the original size of man very much exceeded the average size of the race for two or three thousand years past:—but I insist upon it that we have every reason to believe (§ 927.) that the original form of man was perfectly symmetrical and beautiful,—and that if all the physiological laws of human nature were perfectly and permanently fulfilled, the symmetry and beauty of the original model would be preserved in the posterity; (§ 969.)—and that a well-chosen vegetable diet is more conducive to such effects than animal food or flesh-meat. (§ 974.)—The sacred scriptures, in at least one instance, clearly and fully set forth this same doctrine.

§ 987. During the Babylonish captivity of the Jews, Nebuchadnezzar, the king of Babylon, commanded one of his officers to select from the children of Israel, a number of such as had no blemish, (§ 933.) but were well-favored and skilful in all wisdom, and cunning in knowledge, and understanding science, and such as had ability

in them to stand in the king's palace, and whom they might teach the learning and the tongue of the Chaldeans. And the king appointed them a daily provision of the king's food, and of the wine which he drank; so nourishing them three years, that at the end thereof, they might stand before the king. Among the number thus selected, were Daniel and his three friends, best known by the names, Shadrach, Meshach and Abed-nego. But Daniel purposed in his heart that he would not defile himself with the portion of the king's food nor with the wine which he drank. Therefore he requested of the king's officer that he might not be obliged to partake of the royal provisions. But the officer replied:—I fear my lord the king who hath appointed your food and your drink; for why should he see your faces worse looking than the children which are of your sort?—then shall ye make me endanger my head to the king. Daniel said to the officer, Prove us, I beseech thee, ten days; and let them give us pulse to eat and water to drink, then let our countenances be compared with the countenances of those that eat of the portion of the king's food, and as thou seest, deal with us. So the officer complied with Daniel's request, and proved him and his three friends, ten days: and at the end of the ten days, their countenances appeared fairer and fatter in flesh, than all the children which did eat the portion of the king's food. So the officer took away the portion of the food and the wine appointed for their sustenance, and gave them pulse. And God gave the four children knowledge, and skill in all learning and wisdom: and when the time arrived for them to appear before the king, they were brought into his presence and the king communed with them:—and among them all, was found none like Daniel and his three friends, therefore stood they before the king:—and in all

matters of wisdom and understanding that the king inquired of them, he found them ten times better than all the magicians and astrologers that were in all his realm. And Daniel continued even unto the first year of king Cyrus.*

§ 988. The lovers of flesh, with an intention to dodge the obvious inference of this statement, assert that a miracle was performed in the case:—because, say they, no kind of food could naturally produce such a very marked effect in so short a time.—To this I reply, that the case presents no necessity for a miracle; and affords no evidence of a miracle, and it is contrary to all sound rules of Biblical interpretation, to assume the fact of a miracle where both the necessity for and evidence of one are wanting.—There is no evidence in the case, that any considerable change took place in the appearance of Daniel and his three friends in the ten days, during which they were proved:—but all the evidence in the case leads us naturally to the conclusion, that Daniel and his three friends had long, if not always subsisted on pulse and water or a diet of a similar kind, and that now instead of adopting a new diet, they simply continued on their previous habit of living, which they were indebted for that remarkable fairness and comeliness, as well as wisdom and understanding for which they were at first selected by the king's officer: and at the end of the ten days, they had perhaps, somewhat improved, by special care, in the fairness and plumpness and comeliness of their countenance for which they were distinguished when first selected;—whilst the rest of the selected Jews making a considerable change in their diet,—at the end of the first ten days, probably did not appear so well for it; and thus produced

* Daniel i. 3—21.

a stronger contrast between their countenances and those of Daniel and his three friends.—But if a miracle, be admitted in the case, it only goes still more strongly if possible, to establish the principles for which I contend, for it proves the divine authority for the truth of those principles by miraculous evidence.

§ 989. It is not however, necessary for us to seek for illustrations of these principles in the history of ancient times.—The facts of modern history are sufficient for all our purposes. Let us contemplate them for a few minutes, as collected and arranged, by Dr. Lambe;—remembering however, that the statements which he makes, relate to a condition of things which, in many instances, has undergone a considerable change within a few years past.

a. “The natives of Otaheite,” says Dr. Lambe, “though they use both flesh and fish in moderate quantities, draw their principal subsistence directly from the soil;—practising agriculture in no mean degree of perfection. Of all the food of these people, it has been said, that, at least four-fifths was vegetable; and a large portion of that, was unchanged by culinary preparations. Dr. Foster gives the following description of the bodily organization of the better sort of these islanders. ‘The features of the face, were generally regular, soft, and beautiful:—the nose something broad below;—the chin is overspread and darkened by a fine beard.—The women have an open, cheerful countenance; —a full, bright and sparkling eye;—the face more round than oval;—the features arranged with uncommon symmetry, and heightened and improved by a smile which beggars all description. The rest of the body above the waist, is well proportioned,—included in the most beautiful, soft outline; and sometimes extremely feminine.

The common people are likewise, in general, well-built and proportioned, but more active; and with limbs and joints delicately shaped. The arms, hands, and fingers of some, are so exquisitely delicate and beautiful that they would do honor to a *Venus de Medicis*.^{*}

b. "The inhabitants of the Marquesas are acknowledged by the current testimony of all voyagers, to be a still more beautiful race. And it may be said in general, of the inhabitants of the other Society Islands,—the Friendly Islands—Tanna—New Caledonia—the Sandwich Islands—(in all of which, the natives subsist chiefly on vegetables,) that they have a bodily organization of a high degree of perfection."

c. "Judging from the accounts of all navigators who have visited the Friendly and Society Isles, 'I am inclined to think,' says a recent voyager, 'that the people of the Marquesas and Washington Islands, excel in beauty and grandeur of form,—in regularity of features, and of color, all the other South Sea Islanders.—The men are almost all tall, robust and well made. We did not see a single cripple nor deformed person: but such general beauty and regularity of form, that it greatly excited our astonishment. Many of them, might very well have been placed by the side of the most celebrated masterpieces of antiquity, and they would have lost nothing by the comparison. One man—a native of Nukahiwawa, whom we carefully measured, corresponded perfectly, in every part, with the Appollo Belvidere. The food of these people consists of bread-fruit, cocoa-nuts, bananas, yams, battatas, &c., and mostly in a natural state.'"[†]

§ 990. Dr. Lambe has also with great propriety instituted a comparison between tribes living nearly in the

* Lambe's Reports, pp. 208, 209. † Ib. pp. 212—214.

same climate, and with no other difference of general condition and habit than in what concerns their food.

a. "We may select for this purpose," says he, "the New Zealanders and New Hollanders. Both of these nations are destitute of domestic animals;—both draw a considerable portion of their subsistence from the sea; and both live in a climate sufficiently mild, and nearly equally removed from the equator. But the New Zealander cultivates the soil, from which he draws perhaps one half of his subsistence. The New Hollander uses no vegetables except what he picks up accidentally, the spontaneous produce of the earth. A few berries, the yam and fern-root, the flowers of the different banksias with at times some honey, make up his whole catalogue of substances from the vegetable kingdom. The whole quantity is of course very small.—The consequence is, the New Zealander enjoys a good organization but the New Hollander is defective. Their size, says Dr. Foster, of the former, is generally tall; their body strong and formed for fatigue:—their limbs proportioned and well knit. Of the latter, Collins testifies, that, in general—indeed almost universally, the limbs of these people were small; of most of them, the arms, legs and thighs were very thin."

b. "The Calmucks and the Circassians are not remote from each other, but wonderfully different in their form and physiogamy. The portrait of the former is thus drawn by Dr. Clarke. Nothing is more hideous than a Calmuck. High, prominent and broad cheek bones;—very little eyes widely separated from each other;—a flat, and broad nose;—coarse, greasy, jet-black hair;—scarcely any eyebrow; and enormous, prominent ears, compose no very inviting countenance. And so horrible and coarse was the appearance of the women,

that it was difficult to distinguish the sex. Of the Circassians, we have from the pen of the same writer the following description. ‘‘The beauty of features and form for which the Circassians have been so long celebrated, is certainly prevalent among them.—Their noses are aquiline,—their eyebrows, arched and regular,—their mouths, small,—their teeth are remarkably white; and their ears are not so large nor so prominent as among the Tartars:—although from wearing the head always shaven, they appear to disadvantage according to our European notions. They are well shaped and very active,—being generally of the middle size,—seldom exceeding five feet eight or nine inches. Their women are the most beautiful perhaps, in the world;—of enchanting perfection of countenance and very delicate features. Those whom we saw, the accidental captives of war, were remarkably handsome. The most chosen works of the best painters, representing a Hector or a Helen, do not display greater beauty than we beheld even in the prisons of Ekaterinadara, where wounded Circassians—male and female, loaded with fetters and huddled together, were pining with sickness and sorrow.’’*

c. “Few will hesitate,” says Dr. Lambe, “to pronounce that, this ugliness of the Calmucks is the natural consequence of their diet. The horse is to the Calmuck, what the rein-deer is to the Laplander—his slave in life, and his food after death. But besides horse-flesh, which he often eats raw, the Calmuck devours, indiscriminately, every animal he can kill;—horses, dogs, cats, marrots, rats, &c. and even in a carrion state.—Of the Circassians we know little, except that they subsist

* It should be remembered that the utmost attention is devoted to the cultivation of bodily symmetry and beauty among the Circassians.

chiefly by agriculture. Their country is cultivated like a garden:—and the remarkable whiteness and regularity of their teeth indicate great purity both of the solid and fluid matter which enters into their diet.

d. Lewis and Clark found a tribe of Indians on the banks of the Missouri, called the Ricaras. They cultivated the earth, and raised corn, maize, and other produce in quantities sufficient both for their own consumption, and for sale, and exchange with their neighbors. They drank only water. This tribe was distinguished for the beauty of their persons:—the men were tall and well proportioned and the women were tall and handsome.”*

e. “The Laplanders are of a dwarfish stature. It may be thought that this is the effect of the rigors of their polar cold. But we find interspersed among them, and inhabiting the very same country, numerous families of industrious Finns who cultivate the earth and subsist chiefly on its produce:—and this race, though they remain for centuries in the same country, do not appear to be in the least smaller than the Swedes or Norwegians. This difference therefore, between the Finns and the Laplanders must be attributed mainly or entirely to diet.”

f. “Finally,” says Dr. Lambe, “there is every reason to believe, and particularly from the observations of the navigators in the Pacific Ocean, that those races of men, who admit into their nutriment, a large proportion of fruit and recent vegetable matter unchanged by culinary art, have a form of body the largest,—of the most perfect proportions and the greatest beauty:—that they have the greatest strength and activity, and probably that they enjoy the best health.”†

§ 991. The peasantry of Lancashire and Cheshire,

* Lamb's Reports, p. 218.

† Ib. p. 173.

who live principally on potatoes and buttermilk, are celebrated as the handsomest race in England. Two or three millions of the inhabitants of Ireland subsist in the same way: and probably no portion of the civilized world can present more bodily symmetry and beauty than the peasantry of Ireland who are free from the use of narcotic and alcoholic substances, and of temperate, cleanly and industrious habits. (§ 912. Adam Smith, in his Wealth of Nations, says that “the most beautiful women in the British dominions, are said to be, the greater part of them from the lower rank of people in Ireland, who are generally fed with the potato.”

§ 992. The interesting natives of Pitcairn’s Island, who sprung from the mutineers of his Britannic Majesty’s ship Bounty, strikingly illustrate the principles before us. “Yams constitute their principal food, either boiled, baked or mixed with cocoa-nut made into cakes, and eaten with molasses extracted from the tea-root. Taro-root is no bad substitute for bread; and bananas, plantains and *appoi* are wholesome and nutritive fruits. The common beverage is water; but they make a tea from the tea-plant, flavored with ginger, and sweetened with the juice of the sugar-cane. They but seldom kill a pig,—living mostly on fruit and vegetables. With this simple diet, early rising and taking a great deal of exercise they are subject to few diseases, and Captain Beechey says they are certainly a finer and more athletic race than is usually found among the families of mankind. The young men, all born on the island, were finely formed, athletic and handsome,—their countenances open and pleasing; indicating much benevolence and goodness of heart:—but the young women particularly, were objects of attraction,—being tall, robust and beautifully formed; their faces beaming with smiles, and indicating unruffled good humor.

Their teeth are described as beautifully white, like the finest ivory, and perfectly regular, without a single exception. Captain Pipon thinks that from these fine young men, and handsome, well formed women, there may be expected to arise hereafter in this little colony, a race of people, possessing in a high degree the physical qualifications of great strength united with symmetry of form and regularity of features."

§ 993. "The Indians of Mexico on the Tobasco River," says a very intelligent gentleman, who has resided a number of years among them, "subsist almost entirely on vegetable food:—their principal article of diet is Indian corn. Those who abstain from the use of ardent spirit, are muscular and strong and among them are to be found models for the sculptor."

§ 994. "On entering the cottage of the Hermano Mayor," says the author of *A Year in Spain*, "he came to the door to receive me; signed the cross over my head and pressed my hand in token of a welcome reception. Like other hermits, the Hermano Mayor wore a large garment of coarse cloth, girded round the middle with a rope, and having a hood for the head. The only covering of his feet, consisted of a coarse shoe of half-tanned leather. Yet there was something in his appearance which would have enabled one to single him out, at once, from a whole fraternity. He had a lofty and towering form, and features of the noblest mould. I cannot tell the curious reader how long his beard was,—for after descending a reasonable distance along the chest, it returned to expand itself in the bosom of his habit. This man was such a one, as, in any dress or situation, a person would have turned to look at a second time; but as he now stood before me, in addition to the effect of his apostolic garment, his complexion and his eye had

a clearness that no one can conceive, who is not familiar with the aspect of those who have practised a long and rigid abstinence from animal food and every exciting aliment. It gives a lustre—a spiritual intelligence to the countenance that has something saint-like and divine."

§ 995. Repeatedly as I have spoken of the dangers of deception and misapprehension, in all investigations of this kind, (§ 776. 777. 778. 882. 897. 912. 977.) I am so extremely unwilling to be misled, or to mislead any one, that I feel constrained again to remark that a great variety of modifying causes are to be taken into consideration, when we attempt to test physiological principles, by the apparent facts of human experience and history. Some of those causes are detected with great difficulty: and it is still more difficult to estimate their true force with exactness and certainty.—As I have already remarked, (§ 882.) no considerable portion of the human family has ever adopted and permanently pursued a mode of living which in all respects was regulated by correct physiological principles; and therefore, no human experience can justly be considered as a full and fair test of such principles. Nevertheless, the principles themselves may be ascertained with entire certainty. The facts which have been adduced as evidence on the topic before us, are all of them to be regarded as in some measure, mixed results. Flesh-eating is not to be considered as the exclusive cause of all the physical and physiological facts in the history of those who subsist on animal food:—other causes, favorable or unfavorable (§ 777.) to the physiological interests of the human constitution, universally, and in some instances powerfully co-operate:—and all this is true of those who subsist on vegetable food. Human history as it is, therefore, when taken in the detail, is of little value to physiological science. Yet

when taken in its general average, and correctly estimated, its evidence becomes very conclusive. If we contemplate flesh-eating tribes and nations, we find some individuals comparatively small and some comparatively large —some comparatively ill-formed and some comparatively well-formed: and if we turn our attention to vegetable-eating nations we find the same facts. If also we compare vegetable-eaters with flesh-eaters in the detail, we find some of the former smaller and less symmetrical than some of the latter, and the contrary: and from such views we are led to conclude that nothing is to be proved from human experience in regard to the natural dietetic character of man, except that he is made to eat every thing with equal advantage. Yet when we take a general view, and compare average results, we find a manifest difference, and the evidence becomes perfectly conclusive.—We find that taking all flesh-eating tribes and nations together, though some of them whose circumstances and habits are most favorable to the physiological interests of the human constitution, are comparatively large and well-formed, yet as a general average, they are a comparatively small and ill-formed race; and even the very best of them never approach to any thing like complete and perfect bodily symmetry.—And we find that, taking all vegetable-eating nations together, though many of them, from their excessive use of narcotics (§ 973.) and from other bad habits and unfavorable circumstances, (§ 912.) are comparatively small and ill-formed, yet as a general average, they are a larger and much better formed race than the flesh-eaters;—and it is only among those tribes and nations whose general habits are simple and temperate and who subsist on a pure vegetable and water diet that the most perfect specimens of human symmetry and beauty are found:—and

here they are very numerous, and deformity is very rare. (§ 1040.)

§ 996. It is unquestionably true that, if an individual be fed on flesh with a regimen in all other respects correct—and if from infancy up to manhood he be carefully trained with reference to bodily development and symmetry and beauty, he will be much better formed than one who subsists wholly on vegetable food but whose habits and circumstances are in most or all other respects unfavorable to the symmetrical development of his body. But all other things being equal, it is entirely certain that, as a permanent fact extending from generation to generation, pure, well-chosen vegetable food will better sustain the human constitution in all its powers, and more healthfully and symmetrically develop the body, than a diet consisting of any portion of flesh-meat. (§ 926.)

LECTURE XVI.

Comparative effects of vegetable and animal food on the human body, with reference to suppleness, activity, agility, vigor, ability to endure protracted efforts, &c. &c.—Relative proportion and conditions of the solids and fluids with reference to suppleness, activity, &c. &c.—Causes that render the solids rigid and unyielding—Comparative rapidity of the pulse in flesh and vegetable eaters—Illustrations of suppleness—various instances—Qualifying causes—Vegetable and animal food in relation to strength—Mechanical and physiological elements of voluntary power—Nervous stimulus of voluntary action—Relations between the functions of the arterial system and the physiological power of voluntary action—Law of muscular development and action—Permanency of the power of voluntary action—Qualifying circumstances and conditions—Training of the ancient athletæ—Strength of the lion and rhinoceros—Jewish, Persian, Greek and

Roman soldiers—Russian and Polish soldiers—Peruvian soldiers, native Indians, &c.—Natives of India generally—The Hindoos, their dietetic and other habits, their general condition—Hindoos from the mountains and Hindoo couriers—The Burmese, their habits, &c.—Chinese—their dietetic and other habits, &c.—Egyptians—their dietetic and other habits—Natives of interior Africa—Natives of Pitcairn's Island—Spaniards of South America—Porters and laborers of various countries and islands—Irish porters and coal-heavers—Porters of Smyrna—John of Thessaly—Benjamin Howland—Brindley, the English engineer's testimony—General conclusion.

§ 997. STILL pursuing the physiological evidence in relation to the natural dietetic character of man, we are next led to contemplate the comparative effects of vegetable and animal food on the human body, with reference to suppleness, activity, agility, vigor, ability to endure protracted effort, &c. &c.

§ 998. We have seen, (§ 146.) that all the solids of the human body are formed from fluids:—that in the early stage of infancy the solids are extremely soft and pulpy and the proportion of the fluids is very great to that of the solids, (§ 684.)—and that, as life advances, even under the strictest obedience of the physiological laws of the system, the solids gradually become more consistent, dry and rigid; and the proportion of the solids gradually increases on that of the fluids; (§ 688.) and the cartilages, (§ 185.) ligaments, (§ 188.) and tendons (§ 195.) by degrees become more dry and hard and less flexible and elastic, and the muscles more rigid and unyielding: (§ 200.) and hence the body, which in childhood is exceedingly supple and nimble and elastic, becomes stiff and clumsy and inelastic in old age.

§ 999. Now it is very obvious that the more rapidly we hasten on these changes, (§ 691.) the sooner the body loses its suppleness and elasticity and becomes stiff and unyielding: and hence, habitual spirit drinkers and

those who indulge freely in the various stimulants and heating condiments which so greatly abound and are considered so essential to comfort and almost to existence, in civic life, become stiff and clumsy much earlier in life than those who refrain from the use of such things.

§ 1000. It is a general physiological law therefore, that the more stimulating and heating the diet, the more rapidly the changes in the relative proportion and conditions of the solids and fluids take place,—the more rapidly the solids become dry, inflexible, inelastic, rigid and unyielding, and the body loses its suppleness and activity. Hence flesh-meat is not so conducive to suppleness, agility, grace, &c. as proper vegetable food. (§ 919.)

§ 1001. Scientific experiment has fully proved that, much more of the oxygen of the atmosphere is consumed in respiration, (§ 482.) by the same individual, during the digestion of flesh-meat, than during the digestion of proper vegetable food: and the temperature of the stomach is considerably higher (§ 434.) in the former case than in the latter. And, as we have seen, (§ 919.) it is a fully ascertained fact of great interest and importance that, the most hale, vigorous, active and athletic men who habitually subsist on pure vegetable food and water, have a much cooler skin and a much slower pulse than those who live on a mixed diet of vegetable and animal food.—It was found on careful and repeated examination in different parts of the day, that the skin of the remarkably healthy and robust young men of Pitcairn's Island, always felt cold in comparison with that of the Europeans: and that the pulse of the former was from ten to twenty beats in a minute slower than that of the latter. (§ 992.)

§ 1002. According to every known physiological principle therefore, we are led to the conclusion from

a priori reasoning, that, proper vegetable food is more conducive to the suppleness, activity, agility, and gracefulness of the human body than flesh-meat:—and all facts in the history of man, in relation to this point, when properly ascertained, will be found to agree most strictly with the physiological principles which I have advanced.—Indeed, this is so obviously true that it is hardly necessary to adduce any facts in exemplification of it. I shall therefore present but a few.

§ 1003. “A mulatto girl,” says George Paine, Esq., of Providence, R. I.,* “came to live in my family in her twelfth year:—previously to this, she had remained at home with her parents, who were very poor. She had always lived in the plainest, simplest, and coarsest manner. During her summers she had subsisted almost entirely upon fruit in its natural state; and through the whole year she ate very little except the plainest vegetable food.—On very rare occasions she ate a little flesh; but not enough to render it, in any proper sense, a part of her diet. She drank water exclusively and slept on straw. When she first came to live with me her suppleness, activity, agility and strength so far exceeded any thing that we had ever seen before in such a child, that she absolutely filled us with astonishment by her feats. Of her own accord she was up in the morning as soon as it was light, and wherever she went she always went upon the run, and with the nimbleness and fleetness of a deer. In all her movements she exhibited uncommon natural ease and gracefulness; and in her muscular efforts, she evinced a surprising degree of strength. She would, for our amusement, often throw herself down at length in the grass and imitate the motions of a snake, so exceedingly like a snake that it sometimes gave one very

* This statement was made in 1834. Mr. Paine has since deceased.

unpleasant feelings to look at her; and in a great variety of ways she exhibited the most wonderful suppleness, nimbleness and agility that I ever beheld in a human body. Her mind seemed to be as active and vigorous as her body. Her powers of mental apprehension and retention, and facetiousness and wit, were a continual source of surprise and amusement to us.—On coming into my family she began gradually to accustom herself to flesh-meat, and in the course of two or three months, she became very fond of it and ate it very freely. And to our astonishment,—for we could not then account for the change,—in less than six months, all her remarkable suppleness, activity and agility were gone and she had become exceedingly sluggish, heavy and stupid. We could not get her up in the morning until breakfast-time without special and direct means;—all her movements became slow, heavy and sluggish, indicating great indolence, and her mind became as stupid and inactive as her body:—and such she has ever remained since, being now fifteen years old.”

§ 1004. “I took a boy from the Alms House, in the year 1827,” says Mr. Thomas H. Burling, of Westchester county, New York. “He was then in his thirteenth year, and had always before this subsisted entirely on vegetable food. When he first came to my house he was very remarkably supple and nimble; and would throw a somerset backwards two or three times in succession with great ease. I had a notion that he would be good for nothing to work unless he ate flesh; and so I encouraged and urged him to do so. He soon became fond of flesh and ate it freely, and in less than six weeks he became so clumsy that whenever he attempted to throw a somerset he fell like a log.”

§ 1005. The interesting young natives of Pitcairn’s

Island exhibited the same qualities in a very remarkable manner." "A young girl," says Captain Pipon, "accompanied us to the boat, carrying on her shoulders as a present, a large basket of yams, over such roads, and down such precipices as were hardly passable by any creatures except goats, and over which we could scarcely scramble with the help of our hands. Yet with this load on her shoulders, she skipped from rock to rock like a young roe." Capt. Beechy testifies to the same suppleness and agility in all the youth of the island. (§ 992.)

§ 1006. The Greek peasantry and the lazzaroni of Naples, who subsist on the simplest and plainest vegetable diet, are distinguished for their suppleness, activity and grace. (§ 1052.)

§ 1007. "I returned from Greece with Captain Floyd in the ship Factor," says the venerable Judge Woodruff, of Connecticut, who went out as the Agent of the New York Committee for the relief of the Greeks. "There came over with us to New York, as one of the ship's crew, a Greek youth—a native of Thessaly—whom we called John. He was nineteen years old. He had from his childhood been driven about among the Turks, almost in the condition of a dumb beast; and subsisted on the plainest, simplest and coarsest vegetable food—mostly in a natural state, and chiefly fruit. His nimbleness and agility, far exceeded any thing that I ever before saw in a human being. Without exaggeration I can truly say, that, he would run up and down the shrouds, and out on the yards and jump about on the rigging with all the nimbleness and rapidity of a squirrel. Indeed, his exploits of nimbleness upon the rigging often filled me with amazement, which was sometimes mingled with fear for his safety."

§ 1008. The wild men found at different times in the forests in Europe, and who in their rude state subsisted

entirely on fruits and vegetables, have all been remarkable for their natural suppleness and activity. The wild girl that was found in the forest, would run up trees and leap from branch to branch and from tree to tree, with the nimbleness of a squirrel:—but she lost all this remarkable suppleness and activity when she became accustomed to eat flesh.

§ 1009. Benjamin Howland, Esq., of East Greenwich, R. I., was quite a feeble and infirm man at forty years of age. He abandoned the use of flesh-meat and took to a plain, simple and unstimulating vegetable diet. He soon became a healthy and remarkably active man; and now at the age of eighty-two,* he has more suppleness and agility than most men at fifty. “ Few young men indeed, walk with so quick and elastic a step as he does. When crossing the fields, if a fence comes in his way, instead of pulling it down or crawling clumsily over it, he places one hand on the top of it, and springs over it like an active youth.”—The same experiment has produced the same result in Thomas Shillitoe, of England,† and a great number of others in that country and in America, whom I might mention, but it is unnecessary.

§ 1010. If we make general comparisons between flesh-eating and vegetable-eating tribes or nations the difference is very striking, and has long been a subject of remark by travellers. Those portions of the human family which subsist mostly on flesh-meat have always been noted for their sluggishness, their indisposition to action and their indocility, as well as their savage rudeness: while all those portions of the human family which subsist on vegetable food, excepting such as are besotted by the habitual and excessive use of opium, tobacco,

* This statement was written in 1834. Mr. Howland has since deceased.

† Mr. Shillitoe has also deceased since the text was written.

alcoholic liquor and other intoxicating substances, (§ 778.) have always been noted for their cheerfulness, vivacity, activity, gracefulness and urbanity. The natives of Hindostan and Java, when temperate and regular in their habits, are remarkable for their suppleness, dexterity, agility and gracefulness of movement. (§ 1036.)

§ 1011. In regard to this topic of investigation however, as well as to the preceeding one, (§ 995.) it must be remembered that there are many circumstances and modifying causes to be kept in view. If an individual subsists mostly on flesh,—drinks only water, sleeps on a hard bed,—spends most of his time in the open air,—has considerable active exercise and is always strictly temperate in the quantity of his food, he will be far more supple and active than one who lives in the ordinary mode of civic life on vegetable food and eats freely. However correct and pure our diet may be in quality, if we run to excess in quantity, we are proportionately less supple and active than we should be if we never exceeded the real wants of the vital economy. I once knew a vegetable-eater who was an expert gymnast:—he indulged in over-eating for about one week, and became so clumsy and lost so much muscular power that he could not go through his ordinary feats. He then fasted twenty-four hours, and without breaking his fast went to his gymnasium and performed all his feats with the greatest ease and agility.

§ 1012. It is true also that some individuals, by constantly practising certain feats, learn to exhibit extraordinary suppleness and agility in their particular, educated modes of action, though they may live on a mixed diet. Nevertheless, it is most indubitably true that, all things else being equal, the pure vegetable-eater is naturally and spontaneously more supple, elastic, nimble, active and

graceful than the flesh-eater, or those who subsist on a mixed diet, and he will retain these qualities to a much later period in life.

§ 1013. Among the hundreds of individuals in the United States, who have within five or six years past, adopted a vegetable diet, in every case where temperance in quantity and general propriety of habits have been regularly and consistently observed, there has been experienced a very considerable increase of activity, suppleness and vivacity, and in numerous instances this increase has been remarkably great. Many a man who had begun to feel what he considered the stiffness and rigidity of old age coming upon him, has in a few months after adopting a pure vegetable diet, found, with delight, that much of his youthful suppleness and activity were restored to him; and he has been able to cast aside his staff, and to forego his stiff and tardy gait, and resume the easy and elastic step of early life; and even to run and leap like a youth.

Strength, or Muscular Power.

§ 1014. In regard to bodily strength, or power of voluntary action, two classes of principles are to be considered: viz. the mechanical and the physiological. The mechanical construction of the body, with reference to the power of voluntary action, varies greatly in different animals. Thus in the lion, the remarkable power of voluntary action in the fore limbs does not depend on any extraordinary endowment of the muscles of that animal, but on the peculiar mechanical construction of the parts, by virtue of which, the same contractile power in the muscles exerts a much greater mechanical force. Human bodies differ considerably in this respect. Some indi-

viduals have such a mechanical construction of the body as gives them truly astonishing strength or power of voluntary action, while at the same time, their muscles really possess no more power of vital contractility, in a given volume, than those of individuals of much less bodily strength. Individual instances of great strength therefore, are not always to be considered as accurate exemplifications of physiological principles.

§ 1015. The object of our present inquiry (§ 884.) demands that our evidence should be purely physiological, and therefore, it is only to the pure physiological elements of voluntary power that our attention at present is to be directed.—These elements, as we have seen, (§ 191.) are the vital susceptibility and contractility of the muscles (§ 172.) and the nervous stimulus of motion. (§ 193.) All these are purely vital properties or powers, depending on the vital constitution and condition of the tissues to which they belong, (§ 924.) and consequently, are necessarily affected by every thing that affects the physiological character and conditions of those tissues.

§ 1016. The grand, primary physiological element of voluntary power of action is the vital contractility of the muscular tissue; and the amount or degree of contractile power in any muscle always depends on the perfectness of its vital constitution, (§ 142.) the healthiness of its structure and condition, its compactness and its volume. There are certain kinds of diet and modes of living, which, so long as the vital economy can sustain their forcing and oppressing influence, increase the general function of nutrition considerably beyond the real wants of the economy (§ 509.) and stuff out the skin and round out the limbs and seem very much to increase the real muscular fibre, when in fact the true, healthy muscular structure is very little increased, but, instead of it, a

large quantity of adipose (§ 508.) or oily matter, is deposited in the delicate cellular tissue which surrounds every muscle, envelops every muscular fascicle and sheathes every muscular fibre: (§ 170.) and thus, the limbs and trunk, and particularly where the muscles are more collected into masses, are filled out, and become very plump and have the appearance of a very great augmentation of the real muscular substance. But such an increase of volume in the trunk and limbs, is so far from increasing the muscular power, that it always and necessarily diminishes it. It is only the development of pure, compact, healthy muscle that increases the power of voluntary action and continued effort in the human body.

§ 1017. The second grand physiological element of voluntary power of action is the organic sensibility or susceptibility of the muscular tissue to its appropriate stimulus of motion, by which it is excited to contract. This property of the muscular tissue, like its contractility, depends, as we have seen, (§ 193.) on its own vital constitution or on what may properly be called the *instant* vitality of the tissue: and this instant vitality is sustained by the constant supply of arterial blood. (§ 192.) By every action of the stimulus of motion on the muscle, the vital susceptibility of the muscle to the action of the stimulus, is in some measure exhausted, and by every contraction of the muscle under the action of the stimulus, the vital contractility is in some measure exhausted: (§ 192.) so that, if these properties were not constantly replenished, the susceptibility of the muscle to the action of the stimulus and the contractility of the muscle would soon be completely exhausted. Hence if the supplies of arterial blood be entirely cut off from the muscle, its susceptibility to the action of its natural and

appropriate stimulus is soon so much exhausted that contraction ceases:—but if galvanic stimulus be brought to act on the muscle it again contracts for a few times, till its susceptibility to the action of this stimulus is exhausted and it again ceases to act in the utter exhaustion of all its physiological powers.—But when the supplies of pure, healthy arterial blood are constant, and the stimulus of motion healthy and appropriate, and its action not excessive, the replenishment of the vital properties of the muscle, keeps pace with the expenditure, or nearly so. (§ 376. In a perfectly healthy state and action of the organs of involuntary motion, (§ 377.) this equilibrium is perfect. In the organs of voluntary motion the expenditure somewhat exceeds the replenishment during their action, and hence the necessity of rest to these last organs.

§ 1018. The third, grand physiological element of voluntary power of action is the nervous stimulus of motion. This stimulus, as we have seen, (§ 193.) acts on the vital susceptibility of the muscle and causes it to contract.—In powerful muscular effort therefore, great energy of nervous stimulus is necessary, and hence men in anger, in delirium or madness, in fever and when highly excited by intoxicating substances, and also when intensely stimulated by the passion of emulation, often exert a muscular force which they are utterly incapable of in an unexcited state of the system. But these violent excitements and actions are excessively exhausting, and greatly disturb the vital economy, and are always more or less hazardous to life. The greatest degree of healthy and permanent strength, requires the most perfect vital constitution and full development of the nervous tissue, and a regular and full supply of healthy and energetic vital stimulus of motion. The vital properties and

powers of the nervous tissue, like those of the muscular, are in some measure expended by every vital action, and replenished by the constant supplies of arterial blood. Hence, if the arterial blood be entirely cut off from this tissue, its vital properties and powers will soon be wholly exhausted, and it will no longer supply the stimulus of motion to the muscles; and if the physiological character and condition of the blood be affected, the physiological powers of the nervous and other tissues of the body will always and necessarily be in some measure correspondingly affected. (§ 696.)

§ 1019. We perceive therefore, that there are the most precise and determinate relations established between the functions of the arterial system, and the physiological power of voluntary action in the living animal body. A constant supply of fresh arterial blood is poured into the muscular and nervous tissues to sustain their vitality, and, to all necessary extent, replenish their exhausted properties and powers, and also, to nourish their substance: and hence, as we have seen, (§ 393.) whenever there is an increased action of the muscles of a limb or any other part, there is an increased flow of arterial blood into the tissues of that part; and if the action is habitual, and if the duty of the part requires much muscular power, the unnecessary adipose matter, if any, is thrown off, (§ 510.) the muscle becomes compact, and the pure muscular fibre is considerably increased, and the limb or part becomes largely developed, and strongly marked with large and powerful muscles, as in the arm of the blacksmith and others of similar employment. And even in very fat and heavy people who walk a great deal, the muscles of the lower limbs become largely developed and are far more compact and much less loaded with adipose matter, than any other part of their bodies; and hence, such people

are often very fleet in the foot-race; while they have comparatively little power for any other muscular effort.

§ 1020. The habitual exercise of our body or limbs therefore, in any particular kind of employment, enables us to put forth more muscular power in that employment, or one requiring the action of the same muscles, than in any other. Hence, one individual may excel in the muscular powers of his arms, another, in that of the lower limbs, and another, in that of some other part, according to the nature of the regular employment of each. All these things must be taken into consideration, in our inquiries concerning the comparative effects of animal and vegetable food in relation to the muscular power, or the power of voluntary action in the human body.

§ 1021. Now from what has been said, (§ 1016.) we perceive that, in order to put forth in a single effort, very great muscular power, we require a full development of compact, healthy muscle and a full supply of healthy nervous stimulus of motion; (§ 1018.) and in order to sustain long-continued effort or voluntary action, with the least weariness, we require such a state of the muscular and nervous tissues and such a character and supply of the arterial blood, as will both effect and sustain the continued action of the stimulus of motion and the vigorous contraction of the muscles, with the least excess of expenditure (§ 1017.) over the concomitant replenishment of the vital properties of the tissues: and from every ascertained physiological principle, and every known fact in relation to this point, it is entirely certain that a diet of pure vegetable food and water is more conducive to this state of things than flesh-meat, or than a mixed diet consisting of vegetable and animal food.—Flesh-meat, as we have seen, (§ 916.) being more stimulating than proper vegetable aliment in proportion to the nourishment which

it affords to the system, increases the intensity of vital action, (§ 919.)—precipitates the functions,—renders the processes of assimilation and nutrition less complete and the vital constitution of the organic structure less perfect, and increases the expenditure of all the vital powers and waste of organized substance, in all the vital actions of the system; (§ 924.) and therefore, gives to the muscular tissue less constitutional power of healthy and permanent susceptibility and vigorous contractility, and to the nervous tissue less constitutional power to furnish the due and regular supply of healthy and energetic vital stimulus of motion: and produces blood which is less adapted to replenish the vital properties of the tissues and sustain the vital actions of the organs. (§ 695.)

§ 1022. It is true that a man, living like Alexander Selkirk on the Island of Juan Fernandez, on simple flesh and water, without so much as the stimulus of salt,—sleeping on a hard bed and taking a great deal of very active exercise in the open air and breathing the pure atmosphere of a small island in the midst of the ocean, without any of the debilitating habits or influences of civic life, will become much stronger than a vegetable-eater who connects with his vegetable diet almost every other habit, circumstance and condition, unfavorable to muscular power. So also, a whole tribe like the Pampa Indians of South America, (§ 788.) who subsist almost entirely on the lean flesh of mares,—are continually in the open and pure air of those extended plains, and from infancy to death, almost continually upon horse-back and in motion, may have much more muscular power and ability to endure fatigue, and especially in that kind of exercise to which they are most accustomed, (§ 1020.) than multitudes of vegetable-eating Asiatics, whose habits, circumstances and condition in all other respects are

exceedingly unfavorable to bodily vigor and activity.— Moreover, it is true that those who subsist on a mixed diet of vegetable and animal food and who systematically and severely train themselves for certain feats, (§ 1020.) will exhibit much more muscular power in those feats, than vegetable-eaters not trained and not accustomed to muscular effort. Nevertheless, as a general physiological law of the human constitution, it is entirely certain that, all other things being precisely equal, he who habitually subsists on a diet of pure and well-chosen vegetable food and pure water, will possess greater spontaneous muscular power than those who subsist on animal food, or on a mixed diet; and he will still farther excel them in the ability to endure continued muscular effort: or he will be able to perform more labor in a given time; and to continue hard labor a longer time and with less exhaustion or weariness.

§ 1023. When the public games of ancient Greece, for the exercise of muscular power and activity, in wrestling, boxing, running, &c. were first instituted, the athlætæ, in accordance with the common dietetic habits of the people, were trained entirely on vegetable food. "Those who were destined to this profession," says Rollin, "frequented from their most tender age, the Gymnasia or Palæstræ, which were a kind of academies maintained for that purpose at the public expense. In these places, such were under the direction of different masters, who employed the most effectual methods to inure their bodies for the fatigues of the public games, and to form them for the combats. The regimen they were under was very hard and severe. At first they had no other nourishment but dried figs, nuts, the recent curd of milk, or new cheese and boiled grain or a coarse kind of bread called maza. They were absolutely for-

bidden to use wine and required to observe the strictest continence." Every measure was taken to keep the vital powers in the most healthy and vigorous state and to develop the most compact and powerful muscles. As the time of their public performances drew near, they were trained with increased care and industry, and were rubbed and exercised in such a manner as to consolidate, increase, and strengthen the muscles in the greatest possible degree. In later times, after animal food had begun to be common among the people, and flesh-meat was found to be more stimulating and to render their pugilists and gladiators more ferocious, a portion of flesh was introduced into the diet of the athletæ. But, according to the testimony of early Greek writers, it was soon found that the free use of this kind of aliment made them "the most sluggish and stupid of men;" and therefore, those who had the training of the athletæ withheld flesh-meat from them entirely till a short time before their public performance, and then it was introduced in very small quantities at first and gradually increased. Yet with all this care, the stupefying effect of the flesh-meat was so manifest, and especially on the mental powers, that the stupidity of the athletæ became proverbial.

§ 1024. All this, it will be remembered, was done to prepare them for extraordinary efforts of very short duration, and not for the ordinary and continued efforts or exercise required in the common concerns and employments of life. Yet even for such purposes, it is very certain that the muscular power of the ancient athletæ was not increased by the addition of flesh-meat to their originally simple vegetable and water diet.—It is remarkable that those who are accustomed to the stimulus of flesh-meat, should so pertinaciously contend that it is necessary to produce the greatest muscular power, when it is well

known that, so far as the pure physiological elements of the power of voluntary action are considered, vegetable-eating animals are stronger and are capable of greater endurance than carnivorous animals. The lion it is true, is called "the king of beasts"—"the king of the forest," &c.; but neither his strength nor his courage entitles him to this distinction. In pure muscular power the rhinoceros undoubtedly exceeds all animals now known on earth, and this animal subsists on the lowest order of vegetable food, eating the twigs, branches and limbs of trees, and even shivering their trunks in his terrible power and consuming them like grass. This animal is not more than half the size of an elephant, and yet a whole drove of elephants will fly with terror from the presence of a single rhinoceros, and every other beast shuns him with fear.

§ 1025. It may therefore, be laid down as a general law in relation to the human constitution that, that food which is adapted to the anatomical structure and physiological powers and wants of our bodies, and which, from its own nature is longest in passing healthfully through the processes of assimilation and nutrition, and which, while it affords a proper quantity of nourishment causes the smallest degree of exhaustion of the vital properties of the tissues and waste of organized substance, will sustain a man longest in labor, or in continued voluntary action. And we have seen, (§ 921.) that in all these respects a well chosen diet of pure vegetable food and pure water, is better than animal food and better than a mixed diet.

§ 1026. We have seen that, (§ 779.) according to all ancient history and tradition, the primitive generations of our race subsisted entirely on vegetable food, and generally in its simplest, plainest and most natural state, and that they possessed far more bodily strength and ability to endure protracted labor, than any of their more modern

descendants. The accounts which have come down to us in the writings of the most ancient historians, poets and philosophers, concerning the bodily strength and achievements of the early inhabitants of the earth, are rendered incredible to us by a comparison with what we know to be true of the present generations of mankind.

§ 1027. To say nothing of the mighty warriors of still earlier times, the Jewish army in their conquest of the Promised Land, subsisting wholly on vegetable food of the very simplest kind, (§ 904.) performed such wonders that the astonished nations whom they conquered, believed them to be endowed with supernatural power.— Cyrus, who raised Persia from an obscure, rude colony to one of the most powerful and most splendid empires that the world ever saw,—who performed more extraordinary marches, fought more battles, won more extraordinary victories, and exhibited more personal prowess and bodily power of effort and endurance, than almost any other general that ever lived, subsisted from childhood on the simplest and plainest diet of vegetable food and water; and his Persian soldiers who went with him through all his career of conquest, and shared with him all his hardships, toils and dangers, and on whom he always placed his main dependance in battle, and with whom he was able to march thousands of miles in an incredibly short time, and conquer armies of double the number of his own, were like himself, trained from childhood on bread, cresses and water; and strictly adhered to the same simplicity of vegetable diet, throughout the whole of their heroic course, without relaxing from the stern severity of their abstemiousness, even in the hour of victory when the luxuries of captured cities lay in profusion around them. In the most heroic days of the Grecian army, their food was the plain and simple produce of the soil. The im-

mortal Spartans of Thermopylæ were from infancy nourished by the plainest and coarsest vegetable aliment, and the Roman army in the period of their greatest valor and most gigantic achievements, subsisted on plain and coarse vegetable food.—The same is true of all those ancient armies whose success depended more on bodily strength and personal prowess, in wielding war-clubs and in grappling man with man in the fierce exercise of muscular power, and dashing each other furiously to the earth, mangled and crushed and killed, than in any of the nicer tactics and refinements in the art of war.

§ 1028. It is said that after the Romans became a flesh-eating people, the Roman army was equally heroic and victorious: but it should be remembered that whatever were the practices of the wealthy and luxurious Roman citizen, flesh-meat entered but very sparingly into the diet of the Roman soldier till after the days of Roman valor had begun to pass away; and with equal pace, as the army became less simple and less temperate in their diet they became less brave and less successful in arms. And it should be remembered also, that after the Romans had become a flesh-eating people, the success of the Roman army did not, as at first, depend on the bodily strength and personal prowess of individual soldiers, but on the aggregate power of well-disciplined legions, and on their skill in systematic war. So far as bodily strength and ability to endure continued voluntary action are considered, the Roman soldier was far the most powerful and heroic in Rome's earliest days when he subsisted on his simple vegetable food.

§ 1029. The same important principles are demonstrated by the facts of modern times. "Very few nations in the world," says a sagacious historian, "produce better soldiers than the Russians." "They will endure the

greatest fatigues and sufferings with patience and calmness;" and it is well known that the Russian soldiers are from childhood nourished by simple and coarse vegetable food. It is well known also, that among the bravest and most hardy and enduring soldiers that composed the army of Napoleon Buonaparte in his wonderful career of carnage and conquest, were those who had all their lives subsisted on a coarse vegetable diet. "The Polish and Hungarian peasants from the Carpathian mountains," says a young Polish nobleman, "are among the most active and powerful men in the world: they live almost entirely on oat-meal bread and potatoes. The Polish soldiers under Buonaparte," continues he, "would march forty miles in a day and fight a pitched battle, and the next morning be fresh and vigorous for further duties."

§ 1030. In 1823, General Valdez (a Peruvian general) marched to Lima with an army of native Indians, expecting to find General Santa Cruz with the Patriot army there: but learning that the enemy were advancing at a considerable distance, General Valdez resolved on meeting them as soon as possible by forced marches. Usually, a large number of women—the wives of the soldiers, and sometimes their children, accompany the army: and when the army moves from one place to another, notice is given each morning, where they will quarter at night; and then the women immediately start away (with their children and baggage if any) and when the army arrives at its quarters for the night, the women are always found upon the spot, and the supper prepared for the soldiers. But on this occasion General Valdez wishing to take the enemy by surprise, selected between two and three thousand men, ordered them to leave their women and all unnecessary baggage behind, and every

man to fill his pockets with parched corn for his food. Thus prepared, he appointed each morning, the place of meeting and stopping for the night; and then left every man to make his own way as he pleased. In this manner, General Valdez led his army from near Lima to the southward of Arequipa, a distance of two hundred and fifty leagues, or seven hundred and fifty miles, in eleven days,—or more than sixty-eight miles a day, for eleven days in succession: and at the close of this forced march, met and routed the Patriot army of between three and four thousand men. “These Peruvians,” says a highly intelligent gentleman who has spent twenty years among them, “are a more hardy race, and will endure more fatigue and privation than any other people in the world. They subsist wholly on vegetable food; and being very improvident, their diet is generally coarse and scanty. Parched corn is their principal, and generally their exclusive article of food when engaged in any particular enterprise or effort which requires great activity and power of body: at other times, they subsist on such of the various products of their climate as they happen to have at hand. In travelling, and in many other respects, the women are quite equal to the men in muscular power and agility.”

§ 1031. The inhabitants of Hindostan and of India generally, are constantly named by the advocates for flesh-eating, as a proof that those who subsist wholly on vegetable food, are inactive, effeminate and feeble, and totally destitute of energy and enterprise. But such objectors ought to be too well acquainted with the history, condition and circumstances of these people, to attribute these effects to their vegetable food. They ought to know that for thousands of years, their political, civil, social and religious institutions and usages, have

been such as are calculated to crush or rather to preclude all enterprise, to subdue all energy and to make the people indolent and inactive. Indeed, with the exception of their vegetable food, it is not easy to conceive of a complication of circumstances and combination of causes more omnipotent to suppress and annihilate all the nobler attributes of man, than have surrounded and acted on the people of India for at least, twenty-five hundred years. In the first place, they have nothing to call into action the better energies of human nature, and in the second place, they have every thing to suppress and paralyze those energies. They have nothing to awaken the flame of political ambition—nothing to beget a desire for civil elevation—nothing to develop the character of the statesman nor the intellect of the philosopher or the scholar. The love of gain and the desire for wealth and the social distinctions of life, which are among the most powerful elements of activity and are most efficient in awakening the spirit of enterprise and in developing the physical and intellectual resources of man, are in India, all smothered and subdued: and there is nothing to induce the degraded native to attempt to individualize himself from the stagnant mass of human population, unless it be to become distinguished in a religion which only sinks him deeper in degradation. If by any means, the people can obtain sufficient alimentary substance of any kind, to keep them alive, it is nearly all they are permitted to possess. Every thing beyond this is sure to invite oppression, extortion and outrage. If they cultivate the soil or plant fruit-trees for the purpose of providing sustenance for themselves and families, the hand of extortion comes in and leaves them nearly as destitute as the indolent beggar. If they are known by any management to have laid up a little money, it is by

some iniquitous means extorted from them. The natural consequence is that, all individual enterprise is crushed: and the people have no heart to labor when they know they shall not enjoy the fruits of it. But still, they are human beings—they are intellectual and moral animals, and as such they possess the constitutional instincts of their nature, which prompt them to seek enjoyment. Their intellectual and moral resources are cut off, and they sink down into an animal existence, and seek to keep alive their consciousness and to procure what enjoyment they can, in the exercise and indulgence of their animal sensibilities and appetites. From early infancy they become accustomed to narcotic and other exciting and intoxicating substances, (§ 880.) and through life, indulge excessively in almost every species of stimulation. They marry at twelve and even ten years of age, and are only bounded in their licentiousness by the want of physiological ability to go farther. Though they profess to subsist on vegetable food, yet from their poverty and improvidence and depravity, their diet, and especially among the lower classes, is generally of the most meagre and miserable kind, and they eagerly consume whatever alimentary substance they are able to obtain, whether it be vegetable or animal; and thousands of them devour both vegetable and animal substances of the most crude and filthy and unwholesome quality. But this food they almost universally, from the oldest to the youngest, and in all conditions of life, season very highly with their favorite curry powder; a composition made of cayenne pepper, black pepper, ginger, mustard, and several other ingredients of a very heating and irritating character, calculated to produce the worst disorders of the alimentary canal, and consequently, to reduce the vital energies of the nerves of organic life, and impair all the functions of

the system. Besides these stimulants with their food, almost every man, woman and child, habitually, and often to very great excess, chew a cud composed of opium, cheenam, or lime and betel-nut, wrapped up in a sera leaf of very acrid and pungent qualities. Tobacco, one of the worst of narcotics, whose effects are exceedingly pernicious on the powers and functions of organic life, is in almost universal, and generally, excessive use among them; and a great portion of the natives make a free use of arrack; a very intoxicating, fiery and destructive alcoholic liquor.—Lieutenant Colonel James Todd, —than whom no better authority can be given, in his Annals and Antiquities of Rajast'han, or the central and western Rajpoot States of India, says, that “to Baber, the founder of the Môgul Empire, India is indebted for the introduction of its melons and grapes; and to his grandson for tobacco; but for the introduction of opium, we have no date, and it is not even mentioned in the poems of Chund. This pernicious drug has robbed the Rajpoot of half his virtues, and while it obscures these, it heightens his vices, giving to his natural bravery a character of insane ferocity, and to the countenance, which otherwise beamed with intelligence, an air of imbecility. Like all other stimulants, its effects are magical for a time, but the reaction is not less certain; and the faded form or amorphous bulk too often attests the debilitating influence of a drug which alike debases mind and body. In the more ancient epics we find no mention of the poppy juice, as now used, though the Rajpoot has at all times been accustomed to this intoxicating cup. The essence called arrack, whether of grain, of roots, or of flowers, still welcomes the guest, but is secondary to the opiate. To eat opium together, is the most inviolable

pledge; and an agreement ratified by this ceremony is stronger than any adjuration. If a Rajpoot pays a visit, the first question is—have you had your opiate?"—The Calcutta (India) Gazette, describing the recent celebration of one of the Hindoo religious festivals, says, "The conception of the horrors with which these ceremonies strike every refined heart, is strong in our mind. We see the effeminate lust that inspires the Baboo to bring the first beauties into his house; we see spirits and iquors of all sorts freely indulged in, and terrible tumults excited by their heat; we see excesses of every kind committed without hesitation, and boys of very tender age freely allowed to ramble over nights and nights, and spend hours and hours in immoral pursuits:—we witness youths of fourteen or fifteen years old, indulging to excess in the stupefying and mischievous fumes of tobacco and other drugs; we see goats, rams and buffaloes, savagely butchered, and men rolling on the ground, besmeared with blood and dirt; and at the time when the idols are thrown into the water, young men go upon the river with their lewd companions, and revel in all sorts of licentiousness. In short, if there be any action which is, to the utmost degree, degrading to the dignity of man, and demoralizing to his mind, it is perpetrated at these holidays."

§ 1032. By these means and many others of similar tendency, they have as a general fact, greatly diminished their stature, and rendered themselves comparatively feeble, effeminate, indolent and stupid. For it is a well ascertained truth in physiological science, (§ 973.) that the early and free and habitual use of powerful narcotics, prevents the full development of the body and impairs all its physiological energies, and where narcotics are so

universally and excessively used as in India, and especially by mothers and children, (§ 880.) the inevitable result is a general diminution of size: and this effect is greatly increased when to general excesses in narcotics there is added a general and early excess in lasciviousness.

§ 1033. But it is said that, according to the statement of Rammohun Roy, the Mahomedans in India who eat flesh, have better bodies than the Hindoos, and hence it is inferred that a portion of flesh-meat is essential to the most complete development of the human body even in India. General statements of this kind are not to be received as specific evidence in relation to particular physiological principles. (§ 882.) A thorough knowledge of all the circumstances in the case, would probably show a wide difference between the Mahomedans in India, and the Hindoos, in many other respects besides the kind of their food.—When the Spaniards had dominion in Peru they enslaved the native Indians and reduced them to the most wretched condition, and kept them in the most ignorant and degraded state, that they might not know their rights. Since the Spanish yoke has been thrown off, the Government of Peru, when it is necessary to recruit their armies, take these native Indians by force, and convert them into soldiers: and others they seize and compel to work in the mines. To avoid these oppressions and outrages, the Indians endeavor to shun their oppressors, and retire as far as possible from what is called civilization. They seek an asylum in the mountains, and dwell in rude huts made of logs or cane and mud. These huts are filthy and miserable abodes; and the Indians are extremely filthy in their persons. They wear but little clothing, which they never change. They put on a garment, and never take it off till it is worn out. They subsist wholly on vegetable food. They have in

the valleys, all the vegetable productions of a tropical climate, and on the hills, all those of a temperate climate; and they can sow, and reap—cut grass and grind sugar-cane every day in the year. But so long and so cruelly have these Indians been oppressed, and they feel it so uncertain at what hour they may be torn from their homes, that they are utterly improvident, and never seem to think of to-morrow, but subsist from day to day on what vegetable substance is most easily and readily obtained; and therefore, their diet is generally very scanty. They are universally given to chewing a pungent, exciting leaf which they call coca leaf, and are all fond of an intoxicating liquor made by fermenting corn, and will drink to excess whenever they can get it. In this wretched state, these interior Indians are exceedingly meagre and miserable looking creatures. Yet they have great strength and activity, and will endure severe labor and fatigue for a very long time. The men will carry immense weights. They think nothing of carrying a barrel of flour and other burdens of equal and greater weight, considerable distances. Some of these men are commonly employed as couriers, to go on journeys of several hundred miles, as special messengers, with despatches, into the interior and elsewhere. They prepare for their journey by filling one pocket full of parched corn and another with coca leaf, and these constitute their entire sustenance during their journey. Yet subsisting on this very small quantity of parched corn, they will travel with great speed;—very commonly sixty miles a day for eight or ten days in succession. (§ 1037.)

§ 1034. When these native Indians are taken from their wretched abodes and irregular habits in the mountains, and brought under the regular training and severe discipline of the army and furnished with a proper sup-

ply of good vegetable food, they are in a short time transformed into very fine-looking, active and valiant soldiers, with well-proportioned and athletic bodies.

§ 1035. Here then, we find that without resorting to the use of flesh-meat, the meagre, squalid, vegetable-eating Indian of Peru is, by the systematic training and regular habits of the army, soon transformed into the fine-looking, brave and powerful soldier.—And it is perfectly certain that a similar experiment in Hindostan would be attended with similar results. Let the indolent, inactive, miserable-looking Hindoo be taken from his idle, irregular and sensual habits and put under the systematic discipline and regular training of a well managed army, and be regularly fed with good, wholesome vegetable food in proper quantities, and in a short time his appearance would be so much improved in every respect, that he would look as if he belonged to another race of men. And it is also perfectly certain that, if the everlasting chewing and smoking and drinking narcotic and alcoholic and other stimulating substances, and the excessive licentiousness of the Hindoos could be wholly abolished, and the people could be brought into regular and systematic habits of temperance, cleanliness and industry; and fully supplied with good, wholesome vegetable food and pure water, and relieved from all oppression, and awakened to a spirit of enterprise and a consciousness of freedom and independence, and roused to the pursuit of the rational and proper objects and enjoyments of life, it would require no flesh-meat to develop their bodies in the most healthful, symmetrical and vigorous manner, and render them an active, energetic and happy race: and in the course of a few generations, they would probably rise to an average stature considerably above the present.

§ 1036. And even in the present state of things, the more temperate and virtuous and industrious Hindoos are far from being a feeble and inefficient class of men; on the contrary, they are among the strongest and most active men in the world, and few if any can surpass them in the ability to sustain powerful and continued voluntary action or labor. The laborers from Upper Hindostan or from the mountainous regions, are far more powerful and active men than the stoutest European sailors and soldiers, that visit, or are employed in India. The Encyclopædia Americana says of the Hindoos:— “They are in general of a brownish yellow complexion, but the higher and richer classes are almost as white as Europeans. They are somewhat above the middle height, well proportioned, and, in particular, very flexible and dexterous. (§ 1010.) They possess great natural talents, but are at present deprived of opportunities for their development. In earlier times, before they were oppressed by a foreign yoke, they had reached a higher degree of civilization, and their country has been considered as the cradle of all the arts and sciences. The division of the people into several entirely distinct orders or classes has existed from the remotest times. The three higher classes are by their religion prohibited entirely the use of flesh-meat; the fourth is allowed to eat all kinds except beef; but only the lowest classes are allowed every kind of food without restriction.” And it is in these lowest classes that the most miserable, ill-formed and indolent portion of the native inhabitants of India are found: while among the higher and more intelligent, temperate and virtuous classes, which subsist on a more pure and wholesome vegetable aliment, men of six feet stature and with well-proportioned, symmetrical, vigorous, and active bodies are by no means un-

common; and for natural ease, grace and urbanity, this class of Asiatics are exceeded by no people in the world.

§ 1037. "There is a caste of Hindoos," says Sir John Sinclair, "called on the western side of India, Patta-mars, whose sole occupation is to carry letters and despatches by land; and they perform journeys almost incredible in the time allotted, as is the small quantity of food they subsist on during their journey. They generally go in pairs for fear of one's being taken ill, and are allowed rewards in proportion to the expedition with which they perform their journey. From Calcutta to Bombay, I think twenty-five days are allowed: (about sixty-two miles a day)—from Madras to Bombay, eighteen days: and from Surat to Bombay, three days and a half. They are generally tall—being from five feet ten inches to six feet high. They subsist on a little boiled rice." (§ 1033.)

§ 1038. What has been said of the Hindoos is nearly all true of the Burmese. In the Burman Empire there is the strongest prohibition against taking life and against using any thing which intoxicates. Yet male and female, old and young, rich and poor, all smoke excessively. The women smoke almost incessantly, and it is a common custom among them when nursing their children, to take the pipe frequently from their own mouths and put it into the mouths of their infants. (§ 880.) Every body also, from the infant up, chews the betel-nut—a pungent and exciting vegetable. Rice is the principal food for all who can afford it. The lowest classes use what they consider a poorer kind of food, such as wheat, Indian corn, sprouts, leaves, &c. Excellent wheat grows in the hilly regions, but the Burmese, not knowing how to make bread, boil the wheat whole and eat it as they do rice. They use some fish, but rather as a

condiment than as an aliment. At their times of eating, they take about a teacup-full of dried fish and pound it fine, and season it very highly with red pepper and other hot spices, and this preparation they eat with their rice and other vegetable substances.—The Burman government is probably as despotic and oppressive as any on the globe. It requires seven ninths of all the people can raise or produce. The people are taxed for their fruit trees, their fishing nets and every thing else they possess; so that, the more an individual has the worse he is oppressed by the government. If a man is known to have money, he is vexatiously prosecuted on false pretences, and harassed till he will give up his money to get released. If the king wants supplics of any kind he calls upon his officers next in grade to himself, and these go out and demand the service first, of all those wealthy people who they know will not perform it, but will pay large sums to be exonerated: and after the officers have satisfied their cupidity in this way and pocketed all the money themselves, they will go to those who will perform the service, and order them to do it. Under such a system of oppression and tyranny, the people feel little inducement to make efforts for the acquisition of property or to aim at the improvement of their condition and circumstances. The spirit of enterprise is crushed: and the great mass of the population, sunk to a mere animal existence; exerting themselves little more than is absolutely requisite to secure the necessaries of life; and those often of the poorest kind. Still however, with all this weight of oppression and discouragement pressing them down, and with all the enervating and stupefying effects of their bad habits, the Burmese possess no small degree of bodily vigor and activity, and mental elasticity. The boatmen and other laborers possess great muscular

power and ability to sustain continued effort: and frequently show themselves capable of feats which require extraordinary strength and agility.

§ 1039. In China, as in Hindostan, and Burmah, the people derive their nourishment from the soil. (§ 908.) A small quantity of animal substance, mostly of fish, frequently constitutes a portion of the diet of many of them it is true, but yet it is always more as a condiment than as an aliment. They use no butter nor cheese and very seldom milk. The chief thing they wish and work for is rice; and they can no more understand how human beings can exist without rice, than American flesh-eaters can understand how man can live without flesh-meat. Every substitute for rice is considered meagre and indicative of the greatest wretchedness. “Inquiring whether the western barbarians eat rice and finding me slow to give an answer,” says Gutzlaff, “they exclaimed, ‘Oh! the sterile regions of the barbarians which produce not the necessaries of life! Strange that the inhabitants have not long ago died of hunger?’ I endeavoured to convince them that there were substitutes for rice, which were equal if not superior to it: but all to no purpose:—they still maintained that it is rice only which can properly sustain the life of a human being.” “Next to rice the most universal food in the empire is the white cabbage, a species of brassica. Besides this vegetable, the northern provinces consume millet and the oil of sesamum as a general article of diet. In the more southern provinces several species of gourds and cucumbers, together with sweet potatoes, and one or two species of kidney beans and of peas are used.”* “The Chinese,” says Gutzlaff, “may fitly be compared to ants. The land is filled with men. The houses are not inhabited but

* China, by J. F. Davis, Esq.

stuffed with human beings. Multitudes issue from a few small hovels and swarms seem to rise from the very earth." "The Chinese are probably the most laborious people on earth, and their bodies seem to require the least repose. They labor every day in the year except the first, appropriated to reciprocal visiting among families, and the last, consecrated to the memory of their ancestors." Yet notwithstanding this great industry and the fertility of their soil, which yields them two crops of rice annually, the population is so exceedingly numerous (§ 908. Note) in proportion to their productive resources, that a large majority of the people are compelled to live very abstemiously, and hundreds of thousands of them are so pressed with the demands of hunger, that they eagerly consume whatever alimentary substance they can get from the vegetable and animal kingdoms. Dogs, cats, rats, worms, &c. are indiscriminately devoured by them, and even very considerable quantities of gypsum are eaten with their vegetable substances to satisfy the cravings of the stomach. It is important to remark however, that most if not all this poverty and wretchedness is caused by the great intemperance of the people in the use of opium: for, poor as they are, they all contrive to indulge more or less extensively in this pernicious practice: so that, the three hundred millions of people in China consume nearly eighteen millions of dollars' worth of opium annually. The consumption of this vile drug, while it diminishes their means of subsistence and their ability to labor, at the same time greatly increases the morbid cravings of their stomachs. Still, with all this privation and evil habit, the Chinese generally possess considerable muscular power and particularly for continued labor. Gutzlaff, speaking of his travels in China, says that on a certain occasion, "not being

able to walk, we procured sedan chairs. The bearers appeared to be the lowest of the low,—clad in a few rags and looking as emaciated as if they were going to fall down dead. But under this unseemly exterior they hid great strength. I certainly believe that a well fed horse would not have been able to carry some of us who were stout and hale over the cragged mountains without sinking under the load. But these men walked on briskly and sure-footed, and ascended acclivities with greater speed than we could have done in walking. Yet though these men were meagre, and hungry as wolves, they were cheerful and boisterous.—Of the scanty livelihood upon which the poorer classes, and indeed nine tenths of the nation are obliged to subsist, those who have not witnessed the reality can hardly have an adequate idea. The wages are so low that a man who has worked from morning till evening as hard as he could, gains perhaps ten cents, and with this he has to maintain wife and children.”

§1040. In China however, as in every other country where narcotic and intoxicating substances are generally used, many individuals are to be found of more temperate and correct habits, and these are always favored with better health, and more vigorous and active bodies. “A finer shaped and more powerful race of men exists nowhere,” says Mr. Davis, “than the coolies or porters of Canton; and the weight they carry with ease on a bamboo between two of them, would break down most others.—The freedom of their dress gives a development to their limbs that renders many of the Chinese models for the sculptor.”

§ 1041. In Egypt, the diet of the peasantry and laboring people, is much the same as in China. They use some animal substance, particularly fish, as a kind of relish

or condiment, but their nourishment is derived immediately from the soil. Their food chiefly consists of coarse bread made of wheat, of millet or maize, together with cucumbers, melons, gourds, onions, leeks, beans, chick-peas, lupins, lentils, dates, &c. Most of these vegetables they eat in a crude state. "It is indeed surprising to observe how simple and poor is the diet of the Egyptian peasantry," says Mr. Lane,* "and yet how robust and healthy most of them are, and how severe is the labor which they can undergo."—"The boatmen of the Nile are mostly strong muscular men. They undergo severe labor in rowing, poling and towing; but are very cheerful, and often the most so when most occupied, for then they frequently amuse themselves by singing."—"The Egyptian cultivators of the soil who live on coarse wheaten bread, Indian bread, lentils and other productions of the vegetable kingdom," says Mr. Catherwood, "are among the finest people I have seen."—Opium is not so generally and freely used in Egypt as in many other countries. Tobacco is the principal means (§ 778.) of excitement and intoxication employed by the Egyptians, and this, they use universally and to very great excess. Here as in Burmah, (§ 1038.) both sexes and all classes, ages and conditions smoke at all hours of the day and night, and almost incessantly. Coffee also is drunk at all hours of day and night, and is used nearly as universally and excessively as tobacco: hemp, a violently intoxicating plant, is likewise smoked to some extent by the lowest classes. The Egyptians are also excessively lascivious.

§ 1042. The natives of Central Africa, who subsist wholly on vegetable food, possess astonishing bodily powers. The enterprising Landers inform us that, most of the tribes which they were amongst in Africa subsist

* Lane's Egypt.

principally, and many of them entirely on vegetable food. "The people of Jenna," say they, "have abundance of bullocks, pigs, goats, sheep and poultry: but they prefer vegetable food to animal:—their diet, indeed, is what we should term poor and watery,—consisting chiefly of preparations of the yam and of Indian corn;—notwithstanding which, a stronger, or more athletic race of people, is nowhere to be met with. (§ 905.) Burdens with them, are invariably carried upon the head: and it not unfrequently requires the united strength of three men to lift a calabash of goods from the ground to the shoulders of one, and then, and not till then, does the amazing strength of the African appear.—Some of the women which we saw, bore burdens on their heads that would tire a mule, and children, not more than five or six years old, trudged after them with loads that would give a full-grown person in Europe a brain fever."—The Kroomen are a particular race of people differing entirely from the other African tribes. They inhabit a country called Setta Krow, on the coast near Cape Palinas. Their principal employment is of a maritime nature. A certain number of these men are always employed on board of the ships of war on the African coast, for the purpose of performing those duties where a considerable fatigue and exposure to the sun is experienced.—They only require a few yams and a little palm oil to eat, and they are always ready to perform any laborious work which may be required of them.

§ 1043. "The principal article of food among the Indians of Mexico, and more particularly in the State of Tobasco," says Mr. Pope, who has resided several years among them, "is Indian corn. It consequently constitutes the most important article of agriculture, and three crops may be obtained in a year without the labor of tillage.

From the corn they prepare a thin cake called the Fortilla, which is a bread universally used by the better class of the inhabitants,—and a dough from which is made what they call Posol. The latter article is prepared by boiling the corn, and afterwards crushing it on a flat stone fitted for the purpose and which every family possesses, (§ 782.) —it being substituted for grinding, as corn-mills are unknown in the country. This dough is laid aside until wanted for use, and in a short time, becomes sour, in which condition it is generally preferred. It is then mixed with water to such a consistency as may be drunk; and sometimes a little sugar is added. And on this food alone, they are enabled to subsist and undergo far more fatigue under the tropical sun of Mexico, than our northern laborers in the northern latitudes, with the free use of animal food. I have not unfrequently been forty hours in ascending the Tobasco river, to the capital—a distance of about seventy-five miles—in one of their canoes, against a current of from three to four miles an hour;—the men poling the canoe (a very laborious employment) sixteen hours out of twenty-four. Those who abstain from the use of ardent spirit, are muscular and strong; and among them are to be found models for the sculptor.”

§ 1044. The interesting natives of Pitcairn's Island of whom I have already spoken, (§ 992.) until within a few years, had always subsisted on plain, simple vegetable food, and most of it in a natural state. They were remarkably well formed, active and athletic. “Their agility and strength were so great,” say the British officers who visited them, “that the stoutest and most expert English sailors were no match for them in wrestling and boxing.” “Two of them—George Young and Edward Quintal, each carried at one time, a kedge anchor, two

sledge hammers and an armorer's anvil;—weighing together, upwards of six hundred pounds, and Quintal once carried a boat twenty-eight feet in length."

§ 1045. The Spaniards of Rio Salada in South America, who come down from the interior, and are employed in transporting goods over land, live wholly on vegetable food. They are large and very robust and strong, and bear prodigious burdens on their backs,—such as require three or four men to place upon them, in knapsacks made of green hides:—and these enormous burdens they will carry fifty miles into the country,—travelling over mountains too steep for loaded mules to ascend; and with a speed which few New England men can equal without any incumbrance.—The slaves of Brazil are a very strong and robust class of men, and of temperate habits. Their food consists of rice, fruits, and bread of coarse flour, and from the farrenia root. They endure great hardships, and carry enormous burdens on their heads, a distance of from a quarter of a mile to a mile without resting. It is a common thing to see them in droves or companies, moving on at a brisk trot,—stimulated by the sound of a bell in the hands of the leader; and each man bearing upon his head, a bag of coffee weighing a hundred and eighty pounds, apparently as if it were a light burden. They also carry barrels of flour and even barrels of beef and pork upon their heads. They are seldom known to have a fever or any other sickness.—The Congo slaves of Rio Janeiro, subsist on vegetable food and are among the finest looking men in the world. They are six feet high and every way well proportioned, and are remarkably athletic.—The laborers at Laguira eat no flesh, and they are an uncommonly healthy and hardy race. A single man will take a barrel of beef or pork on his shoulders and walk with it from the landing to the custom-

house, which is situated upon the top of a hill, the ascent of which is too steep for carriages. The cargoes of their vessels are also all lifted by them from their lighters on to the wharves or landing, without any mechanical aid whatever. Their soldiers likewise subsist on vegetable food and are remarkably fine looking men. The laboring men or porters at the Island of Terceira, (one of the Azores,) subsist wholly on coarse, vegetable food, and are exceedingly strong and able to bear very great burdens on their shoulders. A single man will take on a pad upon his shoulders, a half pipe of wine containing fifty-two gallons and weighing in all about five hundred pounds, and carry it to warehouses and up a number of steps.—The Moorish porters at Gibraltar from the Barbary shore, live on coarse vegetable food and are very athletic and hardy. They will carry casks of wine, and other burdens of prodigious weight, on their pads upon their shoulders.

§ 1046. “With respect to the Moorish porters in Spain,” says Captain C. F. Chase, of Providence, R. I., “I have witnessed the exceedingly large loads they are in the habit of carrying, and have been struck with astonishment at their muscular powers. Others of the laboring class, particularly those who are in the habit of working on board of ships, and called in that country, stevedores, are also very powerful men. I have seen two of these men stow off a full cargo of brandy and wine in casks—(after it was hoisted on board and lowered into the hold) apparently with as much ease, as two American sailors would stow away a cargo of beef and pork. They brought their food on board with them, which consisted of coarse, brown wheat-bread and grapes.”

§ 1047. “I have made several voyages to St. Petersburg in Russia,” says Captain Cornelius S. Howland, of New Bedford, Mass. “The people of Russia generally

subsist for the most part on coarse, black rye-bread and garlicks. The bread is exceedingly coarse, sometimes containing almost whole grains, and it is very dry and hard.—I have often hired men to labor for me in Russia, which they would do from sixteen to eighteen hours and find themselves, for eight cents per day (the sun shining there sometimes twenty hours in the day.) They would come on board in the morning with a piece of their black bread weighing about one pound, and a bunch of garlicks as big as one's fist. This was all their nourishment for the day of sixteen or eighteen hours' labor. They were astonishingly powerful and active; and endured severe and protracted labor far beyond any of my men. Some of these men were eighty and even ninety years old; and yet these old men would do more work than any of the middle-aged men belonging to my ship. In handling and stowing away iron, and in stowing away hemp with the jack-screw, they exhibited most astonishing power. They were full of agility, vivacity, and even hilarity,—singing as they labored, with all the buoyancy and blithsomeness of youth.” (§ 1041.)

§ 1048. “The Irish chairmen, porters and coal-heavers in London,” says Adam Smith, in his Wealth of Nations, “who have been raised principally on the potatoe, and who continue to subsist on vegetable food, are perhaps the strongest men in the British dominions.”

§ 1049. “I have frequently witnessed both in England and in Spain, the amazing bodily strength of the salt and coal-heavers, and their ability to perform an astonishing amount of labor in a day,” says Captain Chase. “They perform so much that, they generally work by the ton and not by the day. Much however probably depends on their being accustomed to their particular kind of employment. These men subsist on a simple vegetable

diet; except that in England some of them use milk, or buttermilk, with oatmeal, bread, mush, potatoes, &c. I have visited many respectable families in Ireland, who never allow their children to partake of any other than this simple fare. Moreover, I have been informed by many of the young Irishmen from sixteen to twenty-five years of age, that they had never eaten a pound of flesh in their lives; still they were remarkably vigorous, sprightly and exceedingly well-formed: and the women are uncommonly handsome. And of all classes with which I have ever been acquainted, in all countries and climates, the Irish who have been thus reared and who lead temperate lives, will endure more hardships, fatigue and exposure, than any other."—"The finest specimens of the human body I ever beheld, I saw in Ireland, and they had never tasted animal food," says the Rev. Howard Malcolm, of Boston, who has travelled extensively in America, Europe and Asia.

§ 1050. "The salt and coal-heavers in Liverpool and London are principally Irish," says Captain John Price, of New Bedford, Mass. "I have often employed these men in lading and unlading my ship, and have been surprised at their great strength and power of endurance in connexion with their simple and scanty diet. Their food consists principally of oatmeal and other coarse bread and cheese,—dining on about four ounces of coarse bread and two or three ounces of cheese.—On one occasion, two of these men came alongside of my ship with a boat-load of salt for me: and one of them actually threw that salt with a shovel, up nine feet on to the deck of my ship, as fast as two of my men could throw it into the hold."

§ 1051. "I once discharged a cargo of oil at the port of Lisbon in Portugal," says Captain Cornelius S.

Howland, “and the casks of oil were carried from my ship to the storehouse by porters. These porters came from the interior, on the borders of Spain and Portugal. They subsisted wholly on vegetable food—almost entirely on coarse rye-bread, and were remarkably stout and healthy. I had a cask of oil of uncommon size on board, weighing upwards of thirty-two hundred pounds; and four of these porters,—yoked two and two, took it up by means of ropes going from their yokes under each end of the cask and carried it about fifteen rods to the storehouse.”

§ 1052. “The Greek boatmen,” says the venerable Judge Woodruff, whose interesting mission to Greece I have already named, (§ 1007.) are seen in great numbers about the harbors, seeking employment with their boats. They are exceedingly abstemious. Their food always consists of a small quantity of coarse black bread, made of unbolted rye or wheat-meal—(generally rye)—and a bunch of grapes or raisins, or some figs. They are nevertheless, astonishingly athletic and powerful; and the most nimble, active, graceful, cheerful, and even merry people in the world. At all hours they are singing,—blithesome —jovial and full of hilarity. The laborers in the shipyards live in the same simple and abstemious manner, and are equally vigorous, and active and cheerful. They breakfast and dine on a small quantity of their coarse bread and figs, grapes or raisins. Their supper, if they take any, is still lighter;—though they more frequently take no supper, and eat nothing from dinner to breakfast. It is indeed, astonishing to an American to see on how small a quantity of food these people subsist. It is my serious opinion that one hearty man in New England ordinarily consumes as much food in a day, as a family of six Greeks. Yet there is no people in the world, more athletic, active,

supple, graceful, and cheerful. (§ 1006.)—In Smyrna, where there are no carts nor other wheel-carriages, the carrying business falls upon the shoulders of the porters, who are seen in great numbers about the wharves and docks, and in the streets near the water side, where they are employed in lading and unlading vessels. They are stout, robust men of great muscular strength; and carry at one load, upon a pad fitted to their backs, from four hundred to eight hundred pounds. Mr. Langdon, an American merchant residing there, pointed me to one of them in his service, and assured me, that a short time before, he carried at one load, from his warehouse to the wharf, (about twenty-five rods,) a box of sugar weighing four hundred pounds, and two sacks of coffee weighing each two hundred pounds,—making in all eight hundred pounds:—that after walking off a few rods with a quick and firm step, he stopped and requested that another sack of coffee might be added to his load; but Mr. Langdon, apprehending danger from so great an exertion, refused his request.”

§ 1053. Mr. Jones, in his Sketches of Naval Life, published at New Haven in 1829, speaking of the porters of Smyrna, says that, “the weight which they bear at one load, is often astonishing. I have been credibly informed,” says he, “that five hundred and sixty pounds is a common burden for them; and that it frequently amounts to eight hundred and forty pounds.”—“I once saw one of the porters of Smyrna,” says Lieut. Amasa Paine, of the U. S. navy, “carry three bags of coffee at a load; and I saw those bags of coffee weighed, and carefully took down the weight of each bag at the time. One of them weighed three hundred and twenty-two pounds, another three hundred and twenty-seven, and another three hundred and eleven pounds, making in all nine hun-

dred and sixty pounds."—These porters very seldom if ever partake of any animal food—never enough to produce any effect on their bodies, but they subsist mostly on a very spare, simple and coarse vegetable diet.

§ 1054. "Captain Thayer, in the schooner Lydia, belonging to me," says Mr. Luther Jewett, of Portland, Maine, "came into Portland in the summer of 1831, with a cargo of barilla, (an alkali made of kelp and used in making soap,) from the Canary Islands. I stood by when the schooner was discharging her cargo, and saw four stout American laborers attempt in vain, to lift one of the masses of barilla, which the captain and mate both solemnly affirmed, was brought from the storehouse to the vessel, by a single man,—a native laborer where they freighted, and he subsisted entirely on coarse vegetable food and fruit."

§ 1055. "On our passage home from Greece," says Judge Woodruff, "we encountered a number of severe gales, in which all the sailors were obliged to exert themselves to the utmost. During these times, our Greek boy, John of Thessaly, (§ 1007.) displayed the most astonishing agility and muscular power. He would run out on the rigging, and, hanging by one leg, he would handle the sails with a degree of strength which seemed almost supernatural, when the storm was so severe and the sea so rough that he would often swing so as to describe a considerable part of a circle, and it seemed impossible for any creature to hold fast. I witnessed these exploits with painful dread, expecting every moment to see him shook from the rigging into the ocean, but he felt perfectly secure, and even loved the sport, and seemed 'proud to be daring.'—One day, while we were sailing under a pleasant breeze and nothing for the hands to do, the men amused themselves in performing various feats:—

and among other things, they tried to lift a cannon which was lying upon the deck. We had one very large, stout-built, powerful man amongst the crew—a native of Kentucky—who went by the name of ‘big Charley.’ He prided himself in his strength:—and after several others had tried in vain to lift the gun, he took hold and laid out his whole strength, but did not stir it. He changed his position and tried the second, and the third time with all his might, but was not able to move the gun at all.—After big Charley had given up, and all supposed of course, that it was entirely useless for any one else on board to try, the Greek boy John, who had been idly looking on, came lazily up, and took hold of the gun, and, to the utter amazement of the whole crew, he, with apparent ease, raised it up full two inches from the deck, and laid it down again. The astonished spectators could not believe their own eyes; and to satisfy them that there was no deception about it, he raised it up the second time. This feat appeared so extraordinary to me, that I could not divest myself of a suspicion that there might be some peculiar sleight in it; and as I had been, in my prime, a pretty stout man, I thought I would try my own hand at it. I accordingly watched my opportunity when no one was present to witness my attempt, and, taking hold of the gun in the manner the Greek boy had done, I exerted all my strength; but I could no more move it than if it had been riveted to the deck.”

§ 1056. “ My health,” says Dr. Jackson, a distinguished surgeon in the British army, “ has been tried in all ways and climates; and by the aids of temperance and hard work, I have worn out two armies in two wars, and probably could wear out another before my period of old age arrives. I eat no animal food—drink no wine nor malt liquor, nor spirits of any kind. I wear no flannel,

and neither regard wind nor rain,—heat nor cold, when business is in the way.”

§ 1057. “I was born,” says Benjamin Howland, (§ 1009.) “according to the record, on the 13th day of April, A. D. 1752. In early life, I was frequently troubled with the diseases common to children, and as I advanced in life, I became subject to turns of the colic, and of the sick-headache, which often rendered me unable to labor. After I had arrived at the age of twenty-five years, I concluded that the complaints with which I was afflicted, were caused by some errors in my diet, and I therefore left off eating milk and hot bread, which in a great measure prevented my turns of the colic; but not the headache:—and from that time until I arrived at the age of forty years, generally speaking, my health was but poor. Still apprehending that my frequent indisposition was occasioned by errors in my diet, and being in the habit of using much animal food at that time, I thought my difficulties might proceed from that, and concluded that I would not use any more,—not even fowl,—the advice of my attending physicians and some of my friends to the contrary notwithstanding. I then adopted the use of molasses and water with brown bread or biscuit in it for my dinner, and tea or coffee for my breakfast and supper,—my coffee generally being made from parched barley: and I have continued to use this beverage to the present day, having perceived no ill consequences to proceed from it. My health began to improve immediately, and continued to improve for a number of years, and much of my youthfulness and activity returned. (§ 1013.) I became able to labor, travel or exercise as in early life. I could make stone wall, mow grass, chop wood, &c., and have continued to the present, to be blessed with a good use of my limbs to travel or labor. My

mind, although perhaps never equal to some men's, yet, I may say without boasting, has not, as I can perceive, diminished in its vigor and activity in doing business, for twenty or thirty years past. My sight is as good as common; though I am now eighty-two years old. I see to read out of doors, or at a window without glasses; although I have lost the sight of one eye.—I have no recollection of ever having tasted of rum but once, and that was before I was twenty years old.—I never drank brandy, nor any other distilled spirits, and I think not to the amount of a bottle of wine or strong beer. In my younger years, I sometimes drank a small quantity of cider, but for the greatest part of my life, I have only drank a little, when first made, at the press. I carefully avoid eating all greasy substances as far as possible. I seldom take any butter. I eat vegetables of various kinds;—have no fixed quantity to eat;—generally eat what my appetite craves;—which is not increased by missing a meal, as it was when I made use of animal food. I never was in the habit of using tobacco at any time of life.—I retire at nine o'clock in the evening and rise about sunrise. I generally sleep well, and after a day of hard labor rise the next morning quite refreshed. I have two brothers younger than myself, who are not in my way of living: and do not enjoy so good health, nor are they able to labor as I do: although in younger years, one of them enjoyed much better health than I did. I had a sister who in her youth was unable to walk for fourteen years, in consequence of a kind of rheumatic cramp. During the latter part of that time, she left off the use of animal food, except drinking a tea made from boiling birds in clear water;—she also left the use of that before she recovered and never afterwards made use of any animal food of any kind. She was soon after,

entirely relieved from her rheumatic complaints, and enjoyed a comfortable state of health;—was active,—cheerful, and sensible;—and so continued to her latest moments. She lived over seventy years. I have for many years been in the habit of leading my field at mowing and have continued to do so to the present time. I generally cut from sixteen to twenty-five tons of fodder."

§ 1058. "I have been acquainted with Mr. Benjamin Howland for several years," says Christopher Robinson, Esq., "and I know that he is a very extraordinary instance of bodily vigor and activity, and of unimpaired faculties, for an octogenarian. There are few men at any period of life, capable of doing so much work in a day as he is. Few young men walk with so quick and elastic a step as he does. When crossing the fields, if a fence comes in his way, instead of pulling it down or crawling clumsily over it, he places one hand on the top of it, and springs over it like an active youth. (§ 1009.) Though I consider myself a pretty active young man, yet I do not think I can walk from East Greenwich to Providence (a distance of fourteen miles) in so short a time as Mr. Howland can. His mental powers seem to have suffered as little from old age as his physical. He appears to possess all the soundness of judgment, freshness of memory and shrewdness of mind that he ever did: and for the performance of labor or the transaction of business, he is a much more capable man than many at half his years."

§ 1059. "I have resided many years near Mr. Benjamin Howland and know him well," says Albert C. Green, Esq., attorney-general of the state of Rhode Island. "He possesses the activity and vigor of ordinary able-bodied laboring men at forty years old, and is capable of doing as much work. He has, for many

years past, been in the habit of leading his hands in the field, and has considered that they did a good day's work who held their way with him.—Mr. Robinson read law with me and had a good opportunity of becoming acquainted with Mr. Howland. His testimony concerning him is perfectly correct. Mr. Howland is indeed a very remarkable man for one of his years.”

§ 1060. “A fright, when a lad,” says Mr. Thomas Shillitoe, of Tottenham, England, (§ 1009.) “brought on a very severe nervous complaint, which increased as I grew up. At the twenty-fourth year of my age, my health became so impaired that my medical attendant ordered me to quit London altogether, and put me on a very generous diet. A beef-steak, and some of the best ale that could be procured, were ordered for my breakfast, and at my dinner and supper, plenty of good ale and wine, and, to avoid obesity, vegetable diet. This mode of dieting I pursued for twenty years. My health gradually more and more declined, and my nerves were so enfeebled, that twice I was confined to my bed, from the sudden sight of a mouse. These frights, too, which proceeded from different causes, produced such dread, such horror, such debility, and such sinking and frequent craving for food and stimulants, for several days afterwards, and my frame became so overcharged with the quantity of food and liquids, and my nervous irritability so increased, that I felt as if I could not live.—Smoking, and spirits and water, were then recommended. Although the quantity was increased from time to time, they did not produce the effect I desired. I became alarmed at the consequences, not knowing where it would end. These not producing sleep, I was then advised to have recourse to laudanum. I began with ten drops, yet I found I was obliged to increase my dose three drops

every third night, until it got to one hundred and eighty drops. I left off at that quantity.—In addition to my nervous attacks, (I apprehend in consequence of my generous and high manner of living,) I became bilious, rheumatic and gouty; I frequently had very bad colds and sore throat; and I can only describe the situation I was brought into, by saying I went about day by day, frightened for fear of being frightened—a dreadful situation indeed to be living in.—I made a visit to a medical friend of mine in Hampshire, where I spent some time. This afforded him an opportunity of observing the state of my health, and the effect which my manner of living had on my constitution; and before I quitted his house, he advised me to make a general change in my manner of living—to abandon my beef-steak, and the use of all fermented liquors, and to use animal food but very sparingly.—At first, it appeared to me as if human nature could hardly be willing to submit to my friend's prescription; for my physician in London had desired me to double my portion of ale in the morning, saying my hypochondriacal habit required it. At last I called upon him for his advice, in as debilitated a state of body, I think, as I well could be, to walk about. His advice to me was, to procure some of the oldest Madeira wine that could be got, and to take a bottle in as short a time as possible. A friend of mine provided me some, which he told me was twenty years old. I took the bottle of wine between the hours of eight and ten at night, and it produced very little more effect, such was my state of debility, than if I had taken so much water. But feeling satisfied of the sincerity of my friend, who had enforced to me the necessity of a general change, I made up my mind to be willing to seek help from almighty God, that I might give it a fair trial, satisfied as I was, that nothing short

of his help could enable me to endure the conflict I must undergo.—When I returned to my own home, favored as I believe I was, with that help which would bear me up in making the attempt, I proceeded all at once—for I found tampering with these things would not do—and gave up my laudanum, fermented liquors of every kind, and my meat breakfast. My health began gradually to improve, although I felt some of the effects of the old complaint in my stomach, after I had taken my dinner meal; I therefore confined myself wholly to vegetable diet, and my health has gradually improved from that time to the present, so that I am able to say, to the praise of Him who enabled me to make the sacrifice of these things, that I am stronger now, in my eightieth year, than I was fifty years ago, when in the habit of taking animal food, wine, strong malt liquor, and spirits and water; and my bilious, my rheumatic and my gouty complaints, I think I may say, are no more; nor have I, since this change, ever had an attack of that most dreadful of maladies, hypochondria. I call it most dreadful, from what I have felt of it. It exceeds derangement, because when derangement takes place, the mind is gone.—I find, from continued experience, (it being thirty years since I ate fish, flesh or fowl, or took fermented liquor of any kind whatsoever,) that abstinence is the best medicine. I don't meddle with fermented liquors of any kind, even as medicine. I find I am capable of doing better without them than when I was in the daily use of them.—When I think of my friend who put me on this mode of living, I am satisfied of this, that he did more towards my comfort here, and towards my endeavoring to seek after a better inheritance in the world to come, than if he had given me *ten thousand sovereigns*. It is probable such a present would have promoted an increase of the indul-

gence in which I was living, and would have been almost sure to increase that state of disease which I had from time to time been laboring under.—And another way in which I was favored to experience help, in my willingness to abandon all these things, arose from the effect my abstinence had on my natural temper. My natural disposition is very irritable, and was not helped by my nervous complaint, irritability being very much attached to such complaints. I am persuaded that high living, has more or less effect in tending to raise into action our evil propensities, which, if given way to, war against the soul, and render us displeasing to almighty God.”—When about seventy years old Mr. Shillitoe visited this country, and he was then truly remarkable for his youth-like sprightliness and activity: and the latest accounts of him since his return to England inform us that, though over eighty years of age, he still continues to walk from Tottenham to London,—a distance of six miles.*

§ 1061. “Thomas James, a laboring man of Nantucket, has never eaten any flesh; though he sometimes eats fish. He informed me, a short time since,” says Mr. William Macy, “that he had never been sick, never felt any of the aches and pains of which others complain, and never experienced any painful weariness from labor. He said he could work all day and all night if necessary, without any considerable sense of fatigue. I have known him go into the field in the morning and labor through the day, and come in at evening and eat his supper, and go into the oil-mill and work all night, and then go into the field again in the morning, without a moment’s sleep, and work all day, and yet at the close of the second day, he assured me that he felt no oppressive sense of weariness or exhaustion. He once observed to me that he had several

* Mr. Shillitoe died about a year since.

brothers, all of whom ate flesh freely, and said he, I am worth the whole of them to endure labor, privation and exposure. He is uncommonly nimble and active."

§ 1062. Thomas McGoodin, a laboring man in the Callender factory in Providence, is about forty years old, (Feb. 1834.) small frame, and weighs about a hundred and thirty pounds. From religious considerations he was induced, about the year 1825, to abandon the use of animal food and adopt the most simple vegetable and water diet. After living in this way about seven years and laboring hard, a competition arose in the beetling department of the factory, in which the ability of the laborers to endure powerful and protracted effort was severely tried. Two stations requiring precisely the same exertion, were to be occupied for several days in succession. McGoodin took one of these stations and occupied it through the whole time without flagging in the least: while the other station was successively occupied by three or four of the strongest men in the establishment, all of whom were actually tired out and obliged to be relieved. The overseer of the department declared that he believed McGoodin would kill every man in the establishment, if they were obliged to hold their way with him till he gave out.— McGoodin also labored from one to two hours a day longer than any other man.

§ 1063. Brindly, the celebrated English canal engineer, informs us that in the various works in which he has been engaged,—where the workmen, being paid by the piece, each exerted himself to earn as much as possible,—men from the north of Lancashire and Yorkshire, who adhered to their customary diet of oat-cake and hasty-pudding—with water for their drink, sustained more labor and made greater wages, than those who lived on bread,

cheese, bacon and beer—the general diet of laborers in the south.

§ 1064. I might add a multitude of instances of individuals in the United States, who, within the last five or six years, have adopted a vegetable and water diet, and who have experienced a very considerable increase of strength since they have wholly abstained from animal food; and some of those instances have been very remarkable: but it is sufficient to state in general terms, that excepting those invalids who were, at the time they made the change, affected with an incurable disease, all who have adopted, and strictly adhered to a diet of pure vegetable food and water; and at the same time, consistently observed a correct general regimen, have experienced a decided increase of muscular power: and have found themselves able to perform more labor with less fatigue. Indeed the general experiment has so completely demonstrated the truth of the physiological principles which I have advanced on this point, (§ 1025.) as to render it perfectly certain that, all other things being precisely equal, they, who under a correct general regimen, subsist on a diet of pure and well-chosen vegetable food and pure water, possess more muscular power, and are able to perform more labor in a given time, and to labor much longer without rest and without weariness, than they who subsist either on animal food exclusively, or on a mixed diet of vegetable and animal food.

L E C T U R E XVII.

Comparative effects of vegetable and animal food in enabling the human system to resist the action of morbid causes and to recover from disease—Popular ignorance in regard to the nature of disease, its source and its remedy; and what is required of the physician—Popular error in regard to the virtues of medicine—True health defined—The three opinions of the schools in relation to the nature of disease—The grounds of self-deception and of the success of quackery—The true province of the physician—Disease not natural to the human body—Caused mostly by our voluntary habits—All medicine a poison—The true physician—The abominations of quackery—Causes of disease, of epidemics, &c.—Animal and vegetable food in relation to epidemics—Illustrations, Howard and others—Cholera in New York—Dietetic sources of disease—Correct medical treatment—Little drugging necessary—Medicines often create and perpetuate disease—Importance of correct regimen—Virtues of vegetable diet—Hippocrates' opinion—The principles which should govern every practitioner—Dr. Cheyne and Dr. Lambe of England—Diseases of every type and character have been cured by correct regimen, with little or no medicine—How the diet of a chronic patient should be regulated—The diseased part the standard of power—False notions, in regard to nourishing diseased bodies and being fleshy—Instability of invalids—Comparative effects of vegetable and animal food with reference to longevity, prolificness and the ability to endure cold.

§ 1065. THE physiological evidence in relation to the natural dietetic character of man, derived from the comparative effects of animal and vegetable food on the human body, in enabling it to resist the action of morbid causes,—to recover from disease, and to attain to old age, next demands our attention.

§ 1066. In relation to disease, and the true principles and means of cure, the most universal and lamentable ignorance prevails among mankind. (§ 12.) Few, probably, ever attempt to define their own notions on the subject, but are content to go through life with the most vague and indistinct impressions. Yet, if we were to take the actions of men as true expressions of their ideas, we should unhesitatingly say that, human beings almost universally, consider health and disease as things absolutely and entirely independent of their own voluntary conduct, and of their ability to control. They regard diseases as substances or things which enter their bodies with so little connexion with their own voluntary actions and habits, that nothing which they can do, can prevent disease, nor vary the time nor violence of its attack: (§ 32.) and, according to their education, they believe it to be the effect of chance or of fate, (§ 14.) or a direct and special dispensation of some overruling Power or powers. (§ 28.) The consequence is that, they either submit to disease, as an element of their irresistible destiny, or seek for remedies which will kill it, or expel it from their bodies, as a substance or thing, independent of the condition and action of their organs. This latter notion is probably, far the most prevalent. People generally consult their physicians as those who are skilful to prescribe remedies that will kill disease; and these remedies they expect to act either as an antidote to a poison, or as an alkali to an acid, or in some other way, with little or no reference to the condition and action of their organs, and to their dietetic and other voluntary habits. Many indeed, seem to think that their physicians can take disease out of them and put health into them, by the direct application of remedies—and that there is in the remedies themselves, when skilfully chosen and applied, a health-giving potency,

which, of its own intrinsic virtue, directly and immediately imparts health to the body.

§ 1067. This erroneous notion, as a matter of course, leads people to place their dependence on the sovereign virtue of remedies, and consequently, to undervalue the highest qualifications of the well educated and truly scientific physician, (§ 34.) and to place equal or even greater confidence in the ignorant and blustering quack who impudently pretends to have discovered a true and infallible remedy for every disease. The result of all this error is, in the first place, mankind do not believe that their own dietetic and other voluntary habits and actions, have much, if any thing to do with the preservation of health and the prevention of disease:—in the second place, when diseased, they expect to be cured by the sovereign power of medicine alone; and do not believe that any particular diet can of itself, be of any great importance either in preventing or promoting their restoration to health.—In the third place, relying wholly on the intrinsic virtues of medicine, they conceive that that *medicine* is quite as potent from the hands of one man as another, and are ever ready to run after those who are the loudest and most confident in their pretensions, and this opens the door for unbounded empiricism and quackery, and for the immense evils which flow from blind and indiscriminate drugging.

§ 1068. All this mischief arises mainly from a want of correct knowledge of the nature of health and the general principles and philosophy of disease. Life, I have said, (§ 41.) is a mystery to man;—we cannot appreciate nor detect it by any of our senses, nor by any scientific powers or means which we possess. It is therefore only known to us by its phenomena;—or by the powers which it manifests and the effects which it produces. It cannot,

as we have seen, (§ 108.) be the effect of organization, but is necessarily the cause of organization. Nevertheless, so far as we know any thing about it, organization is the essential medium of its manifestations and perpetuity. (§ 121.) It resides intimately and constitutionally in the tissues and substances of our bodies, (§ 203.) and endows those tissues with all their peculiar properties—and entering with those tissues into the composition of all our organs, imparts to those organs their peculiar functional powers. (§ 312.)

§ 1069. The organization with which life is thus intimately connected, consists of certain arrangements of the matter which is common to all material forms, organic and inorganic; (§ 106.) and which, as matter, is subject to the more primitive laws and affinities of the inorganic world. (§ 115.) But, as we have seen, (§ 117.) the arrangement of matter in organic forms, according to the constitutional laws of vitality, is an effect directly contrary to the more primitive laws and inorganic affinities of matter; (§ 110.) and hence, vitality produces all of its peculiar effects, and maintains its controlling sovereignty in its organic dominion, in direct opposition to the more primitive laws and inorganic affinities of matter: (§ 126.) and consequently, those laws and affinities continually act to overcome and destroy life. (§ 127.) And vitality, in resisting the hostility of those laws and affinities, and maintaining its own sovereignty and carrying on its peculiar operations, acts in and through its organization, and depends on the power of the vital constitution of the tissues (§ 924.) and the integrity of the organs.

§ 1070. Health therefore, may briefly be defined to consist in the correct condition and action of all the vital powers and properties of our bodies: and this necessarily involves the proper development, and correct

operation and condition of all the organs, tissues and substances of our bodies.

§ 1071. Concerning disease, medical men have been divided into three schools. First, those who have considered disease to consist essentially, in certain conditions of the fluids of the body. "The human body," says Hippocrates, "contains four humors, very different with respect to heat and cold, moisture and dryness, viz: blood, phlegm, yellow bile and black bile. Health consists in a due mixture of these four: and whatever produces a redundancy in any of them does hurt."—This is the foundation of humoral pathology, which, with various modifications, has been embraced by a very large proportion of the medical profession from the days of Hippocrates to the present;—and of course, has constituted the basis of the theory and practice of medicine of that school. Their remedies and modes of treatment have been exhibited and pursued, mainly, if not entirely with a reference to the state of the fluids, and aiming to correct the humors. This scheme of humoral pathology has opened the widest door for every kind of quackery in all ages.—Medical astrology and alchymy of earlier times, and the elixirs of life, catholicons, panaceas, hygeian pills and other species of quackery in our own day, have all been founded on humoral pathology; and their proprietors have always talked about the impurities of the blood, the humors, &c. and the potency of their remedies to purify the blood, and sweeten the humors, and thus remove or prevent all diseases of every kind and type.

§ 1072. The second school of physicians consider that disease consists essentially in the peculiar condition and action of the solids. They believe that by the action of disturbing causes and morbid agents on the solids of the body, these latter are irritated and diseased and thus

derangement of function—morbid irritability—local, or general inflammation, fevers, change of structure, &c. &c. are induced. This school also, of course, adapt their therapeutics, or theory and practice of medicine to their scheme of pathology. They seek to subdue irritation and restore healthy action, by abstracting irritating causes and by the exhibition of sedative and narcotic medicine; or, to overcome the irritation and unhealthy action of one part by producing special irritation in another part—on the principle of counter irritation:—and it is upon this principle almost entirely, that all those accidental cures are effected to which all quack medicines owe their reputation.—By improper quantities and qualities of food (§ 520.) and other errors of diet and habits, people oppress and irritate their systems, till they begin to be affected with unpleasant, and perhaps painful symptoms of disturbed action, and, it may be, diseased condition of some of their organs. These symptoms they mistake for the disease itself, and fly to the use of remedies for sour stomach, dizziness, head-ache, sore eyes, rheumatism, pain in the breast, side or back, or for catarrh, cough, cramps, eruption, debility, or something else. If these symptoms do not arise from the actual disease of any particular part, but from the general oppression of the system, caused by excessive alimentation, any drug which will powerfully evacuate the alimentary cavity and cause considerable depletion, will at once relieve the symptomis for which it was taken. Or if the symptoms arise from the morbid condition and unhealthy action of some particular organ or apparatus of the system, the medicine, if it possess any potency, by rallying the vital forces in reaction against its pernicious properties, induces a new disease, which, upon the principle of counter irritation, causes a determination from the old to the new point of

morbid action, and thus perhaps, subdues the symptoms for which it was taken, and receives the credit of curing the disease. Where there is considerable constitutional and restorative energy in the system, and no particular part is very deeply diseased, the vital economy will often avail itself of the new action and determination caused by the medicine, to recover the health and integrity of the part previously affected: yet it is always necessarily at the expense of greater or less injury to other parts and to the constitution generally, from the action of the medicine. And if the cause which induced the primary difficulty be continued, the inevitable result will be, either that, the old symptoms will sooner or later return with increased violence, or other symptoms arising from the diseased condition of the same part, and modified by the action of the medicine, will occur; or new symptoms arising from the diseased condition of other parts predisposed by the effect of the medicine, will take place. But, so that the symptoms are temporarily subdued or mitigated, or changed, the unfortunate sufferer is deceived into the belief that he is benefited by the medicine; and under this delusion perhaps, perseveres in the use of remedies, which often become the most efficient causes of his sufferings, till he drugs himself to death, to the glory of the medicine and the emolument of the mercenary quack.

§ 1073. The third school of physicians combine to some extent the views of the other two. They consider that the solids and fluids are both concerned in disease: and their theory and practice of medicine correspond with this opinion. And there can be no doubt that the diseased condition and action of the solids produce, to a greater or less extent, a morbid state of the fluids, and that this morbid state of the fluids reacts upon

the solids to increase their irritations and aggravate their disease. But let us look at this matter a little more in detail.—Pure, healthy chyme is produced exclusively by the healthy function of the alimentary canal; (§ 320.) and the alimentary canal can perform this function healthfully, only while itself is in a healthy and undisturbed condition. Pure, healthy chyle can only be produced by the healthy function of the lacteals. (§ 465.) Pure, healthy arterial blood can only be produced by the healthy functions of the lacteals, lungs and other organs concerned in hæmatosis, or the formation of blood. (§ 484.) Perfectly healthy bile can only be produced by the healthy function of the liver: and so on, of all the other fluids and humors of the whole system.—Now then, suppose the chyme, or chyle, or blood, or bile, or any other fluid or humor of the body, to be unhealthy and impure;—is it possible for any physician or any other human being in the universe, to apply such a remedy as will of its own intrinsic virtues, directly and immediately impart health and purity to any of those substances?—Most certainly not! There is no possible way in nature of producing these effects, but by the healthy function of the organs constituted for that purpose. If the bile is unhealthy, no medicine in the universe can directly impart health to it. The healthy function of the liver alone, can make the bile healthy; and while the function of the liver is perfectly healthy, the bile cannot be unhealthy. If the blood is impure, no medicine in the universe, can, by its own intrinsic virtues, directly and immediately impart purity to it! There is no possible way in nature by which it can be purified, but by the healthy function of the appropriate organs of the body.

§ 1074. If then, by any means, the blood becomes impure, the healthy functions of the appropriate organs,

will very soon purify it. But whatever may be the quality and potency of the medicines used to purify it, so long as the functions of those appropriate organs, are unhealthy, the blood will and must remain impure:—and this is true of all the fluids and humors of the system.—It is true however, as we have seen, (§ 1072.) that by the continued application of such remedies, the original symptoms for which they were applied, may, upon the principle of counter irritation, be removed and other symptoms be established, which will disappear when the remedies are abandoned; and thus, in some instances, health may be restored:—in other instances, the old symptoms will return after a short time; and probably in a more aggravated form:—and in other instances, new symptoms and perhaps of a much more serious character, may be permanently established:—while the patient himself and very often his physician also, will never suspect that the new symptoms have been produced by the very remedies by which the old symptoms were removed.

§ 1075. We see therefore, that the essential elements of health, are the healthy condition and functions of the organs of the human body; (§ 1070.) and these elements are preserved by a strict conformity to the laws of constitution and relation established in our nature; (§ 693. *et seq.*) and they are destroyed or impaired by every infraction of those laws. And such are the sympathies of the system, (§ 297. 298. 521.) that not only are the organs immediately acted on by disturbing and morbid causes, themselves affected and their functions deranged and diseased by such causes, but other organs also, sympathizing with those immediately acted on by those causes, partake of their irritations, and by these sympathetic irritations, are often made themselves the seats of local disease; and when disease is thus once induced, even

slight, habitual disturbances and irritations from dietetic errors and other causes, are sufficient to keep it up for many years, till it terminates perhaps in death.

§ 1076. We see also, that no physician, nor any other human being in the universe, can come to us when we are diseased, and by any exercise of skill or the application of any remedy, directly and immediately impart to us any health, or remove from us any disease. But the truly enlightened, scientific and skilful physician is generally able to discover the nature of our disease, and to ascertain what disturbing causes must be removed, and what means must be employed in order to the restoration of the healthy action and condition of every organ and part, and thus, by assisting nature's own renovating and healing economy, relieve the system from disease and enable it to return to health.

§ 1077. For, it ought to be well understood that **DISEASE IS NEVER THE LEGITIMATE RESULT OF THE NORMAL OPERATION OF ANY OF OUR ORGANS.** The natural and legitimate result of all the normal operations of our vital economy, is always health and only health: and if disease is induced, it is always by causes which disturb those operations. Indeed, disease itself, as a general fact, may be said to be, in its incipient state, nothing more than an excess of healthy action to resist morbid causes; and this excess being carried too far, and continued too long, the overacting parts are brought into a morbid condition, and perhaps, involve the whole system in sympathetic irritation. All that nature asks, or can receive from human skill in such a condition therefore, is the removal of disturbing causes; and she will, of her own accord, as naturally as a stone falls to the earth, return to health; unless the vital constitution has received an irreparable injury. Disease is therefore, not

only induced by disturbing causes in the first place, but it is kept up by the continual action of such causes. It is true that when the action of disturbing causes has induced diseased structure in our organs, this, while it remains, will in the absence of all other morbid causes, keep up diseased action to a greater or less extent, in the system. But as a general law, in chronic complaints, where change of structure has not actually taken place and gone too far for vital redemption, diseased action will not long continue, after the entire removal of the disturbing causes: and hence, chronic disease is, in almost every instance, kept alive and cherished from day to day—from month to month and from year to year, by the constant action of those disturbing causes which are mostly to be found in our dietetic and other voluntary habits.

§ 1078. It ought furthermore, to be well understood, that ALL MEDICINE AS SUCH, IS IN ITSELF AN EVIL; that its own direct effect on the living body is in all cases without exception, unfriendly to life; (§ 1072.) and the action of all medicine as such, in every case, to a greater or less extent, wears out life, impairs the constitution and abbreviates the period of human existence. Still however, in the present condition of human nature, there are frequent cases of disease in which medicine, to some extent, is indispensably necessary to the salvation of life; yet even in all such cases, medicine is at best a necessary evil; and therefore, should only be used when, and to the extent, indispensably necessary. And consequently, the physician who assists our nature to throw off disease and recover health, with the least use of medicine, is the best friend to our constitution and evinces the most true science and skill, and deserves our highest respect and warmest gratitude. To throw an immense quantity of

medicine into the diseased body, and accidentally kill or cure, as the event may happen to be, requires but little science or skill: and extensive experience has taught us that it may be done as well by the acknowledged quack as by the licensed physician:—but to understand all the properties, powers, laws and relations of the living body so well as to be able to stand by it in the moment of disease, and as it were, to look through it at a glance, and detect its morbid affections and actions, and ascertain its morbific causes, and to know how to guide and regulate the energies of life in accordance with its own laws, in such a manner as to remove obstructions—relieve oppressions, subdue diseased action and restore health, with little or no medicine, but principally or entirely by a regimen wisely adapted to the case, evinces the most extensive and accurate professional science and the most profound skill;—and such qualifications are essential to the character of a truly enlightened and philanthropic physician; and such physicians truly deserve the support and respect, and admiration and love of every member of society, as standing among the highest benefactors of the human family.

§ 1079. But what must we think of those creatures wearing human shape, who, either with the good intentions of honest ignorance, or with the base motives of cupidity,—with exceedingly little, or no knowledge of the human constitution and the laws of life, and without ever seeing their thousands of patients, or knowing any thing of the nature or causes of their diseases, open their patent medicine manufactories in London, and Philadelphia, and New York and other places, and deluge the earth with their panaceas, and catholicons, and hygeian pills, and thousands of other vile preparations, and boldly recommend them as infallible specifics for every disease that

man can force upon his nature? Surely, they are to be regarded as among the very worst enemies of their species: and many, if not most of them, ought to be ranked with pirates and assassins: for, with little if any less turpitude of heart and wickedness of intention, they destroy the lives of hundreds where pirates and assassins do of one.—And they will continue their successful career of human butchery, till the all-pervading ignorance and delusion of our fellow creatures, which render them capable of being deceived by such impostors, and made willing to swallow immeasurable quantities of their pernicious drugs, shall be dispelled by the universal diffusion of knowledge in regard to the constitutional nature and relations of man.

§ 1030. Health, I have said, (§ 1070.) may briefly be defined to consist in the correct condition and action of all the vital powers and properties of our bodies, and this necessarily involves the proper development and correct operation and condition of all the organs, tissues and substances of our bodies; and the more perfectly we conform to the laws of constitution and relation established in our nature, (§ 693. *et seq.*) the more perfectly and certainly we preserve such a state of things; and in such a state of things, our bodies possess their greatest vital power to resist the action of foreign, disturbing and morbific causes generally, and of all special and extraordinary morbific or pestilential causes.

§ 1081. But whatever irritates our organs and disturbs their functions, not only tends to originate disease in the system, but always commensurately diminishes the power of our bodies to resist the action of foreign morbific and pestilential causes. It is possible that in some exceedingly rare instances, changes in the state of the earth or atmosphere, or the influence of comets or some other

heavenly bodies may be such as absolutely to induce disease in man and other animals, in any condition of their vital powers, and wholly independently of their dietetic and other voluntary habits. But it is very questionable whether such a state of things ever happens: and it is certain that if it does, it is extremely seldom, and only on a very limited extent of the earth's surface: for in such a case, not only many, but every human being without exception, and probably most or all the lower animals, at least of the same natural class, would be diseased at the same time, over the whole extent of the earth's surface where such a cause prevailed. But neither history nor tradition gives us any information that such an event ever took place.

§ 1082. Changes in the state of the earth and its atmosphere, and especially of the latter, have undoubtedly very often, and very extensively, been immediately exciting causes of disease in man, when there was a considerable predisposition to disease induced by other causes.—As a general fact however, the grand sources of disease are the erroneous dietetic and other voluntary habits and actions of mankind. By introducing into the nose, mouth, lungs, and stomach, substances unfriendly to life, (§ 520.) —and by introducing into the stomach proper alimentary substances, in an improper condition, or quantity, or at improper times,—by errors in regard to exercise, rest, sleeping, cleanliness, clothing, &c. &c.—by an undue exercise of the mental faculties and over-excitements of the mind,—by an inordinate exercise of the passions such as love, fear, anger, &c., and by many other causes within the compass of man's voluntary agency, the nervous system is almost continually, and in nearly every member of the human family, kept in a state of more or less powerful and extensive irritation;—and by this means

the functions of the several organs are disturbed and their functional results deteriorated;—the healthy condition of the organs themselves is impaired, and more or less of a morbid irritability and sympathy are induced in the nervous system generally: and thus, diseases of every description are originated in the system by internal disturbances; and by the same means, the power of the living body to withstand the action of foreign morbific and pestilential causes, is exceedingly diminished.

§ 1083. We perceive then, that, not only whatever produces irritation in the system, but also, whatever excites the nerves and accelerates the functions of the organs, and increases the exhaustion of their vital properties, beyond what is essential to the most healthy operations of the vital economy (§ 745.) and the most perfect results of the vital processes of composition and decomposition, (§ 314.) always necessarily diminishes the power of the living body to resist the action of foreign, morbific and pestilential causes and increases its liability to be morbidly affected, or to become diseased by the action of those causes.

§ 1084. We have seen (§ 916.) that, animal food or flesh-meat is decidedly more stimulating in proportion to the quantity of nourishment which it actually affords the system than proper vegetable food; that it increases the vital action of the whole system, causes a more rapid pulse and a hotter skin; (§ 919.)—hastens all the vital processes and renders the vital changes less perfect. We have seen also, (§ 924.) that the chyle formed from animal food, when taken from the living vessel, much more readily becomes putrid than that which is formed from vegetable food; and that the human blood formed from animal food will putrefy, when taken from the living vessels, in a much shorter time and much more rapidly,

than that formed from pure vegetable aliment: and that, there is always—other things being equal—a much greater febrile and putrescent tendency in the living bodies of those who subsist mostly on animal food than in those who subsist wholly on pure vegetable aliment, and hence, the susceptibilities of both the fluids and the solids, to the action of morbid causes, is greater in the flesh-eater than in the vegetable-eater. Moreover, it is a very important fact—and especially in relation to civic life, that the pulmonary and cutaneous evacuations of the human body are much less morbid and pestilential in their tendency, when pure vegetable aliment is used than when flesh-meat is used.—As a general fact therefore, all the vital powers of the human body are preserved in a more vigorous condition and all the vital functions are more healthfully and perfectly performed in the use of proper vegetable food, than in the use of flesh-meat; and consequently, the human body has more vital power to resist the action of foreign morbid and pestilential causes, and to maintain permanent health, when nourished by well-chosen vegetable food than when nourished by flesh-meat, or than when nourished by a mixed diet of vegetable and animal food.

§ 1085. I wish to be clearly understood on this point however;—I do not affirm that the mere abstinence from animal food and living on vegetable food exclusively, without any regard to a proper regimen, will better enable our bodies to withstand the action of foreign morbid causes, than a mixed diet, under good regulations. I continually insist upon it, and wish it to be distinctly remembered, that vegetable food *can* be made incomparably more pernicious than plain, simple animal food in temperate quantities. It is infinitely better to subsist on a mixed diet of vegetable and animal food under a good general

regimen, than to live wholly on vegetable food, badly selected, viciously prepared, and eaten in inordinate quantities, while at the same time, we live in the violation of almost every other correct rule of health. Be it remembered therefore, that in all the comparisons which I draw between the effects of animal and vegetable food on the human body, I always proceed upon the condition that all other things are precisely equal. It is indubitably true that individuals living on poor and scanty vegetable food, in filthy and miserable hovels,—indulging habitually in the use of tobacco, opium, ardent spirit, and the numerous other intoxicating and stimulating substances used by human beings, (§ 778.) would be far more likely to be morbidly affected by pestilential causes, than those who, surrounded by comforts, with cleanly and well-regulated habits, subsist temperately on a mixed diet of vegetable and animal food. But the question is,—would the same individual or any number of individuals whose habits and circumstances are in all other respects correct, be better able to resist the action of foreign morbid causes, when subsisting exclusively on a well-chosen and well-regulated vegetable diet, than when subsisting on a mixed diet of vegetable and animal food? To this question I reply, unhesitatingly, that both physiological science, and facts prove that the pure vegetable diet is the safest and the best; because it is best adapted to the organization and to the physiological properties and powers of the human body.

§ 1086. As to facts, they may be gathered in great abundance from the history of the human family in all periods and portions of the world, but enough can be found in modern times and even in our own day and country, to satisfy every mind that is willing to receive the truth.

§ 1087. Howard, the celebrated philanthropist, was probably more exposed to the influence of pestilential causes than any other human being that ever lived. "In the period of sixteen or seventeen years," says his biographer, "he travelled between fifty and sixty thousand miles, for the sole purpose of relieving the distresses of the most wretched of the human race. The fatigues, the dangers, the privations he underwent or encountered for the good of others, were such as no one else was ever exposed to, in such a cause; and such as few could have endured. He often travelled several nights and days in succession, without stopping,—over roads almost impassable, in weather the most inclement, with accommodations the meanest and most wretched. Summer and winter, heat and cold, rain and snow, in all their extremes, failed, alike, to stay him for a moment, in his course; whilst plague and pestilence and famine, instead of being evils that he shunned, were those with which he was most familiar; and to many of whose horrors he voluntarily exposed himself; visiting the foulest dungeons, filled with malignant infection,—spending forty days in a filthy and infected lazaretto,—plunging into military encampments where the plague was committing its most horrid ravages; and visiting where none of his conductors dared to accompany him;" and through all this, he subsisted entirely on a most rigidly abstemious vegetable diet, carefully avoiding the use of wine and all other alcoholic drinks:—and such was the result of this man's extensive experience and observation, that he earnestly advised others who were exposed to the plague, to abstain entirely from the use of animal food; and this, it cannot be supposed, he would have done, had he not been fully confident of the correctness of such advice, both from what he had experienced in himself, and from what he had seen in others. And it

must be remembered that Howard's opportunity to test the correctness of this opinion, was neither brief nor limited, but the most extensive, varied and long-during ever experienced by any one man; and such were the accuracy of his observations and the soundness of his judgment, that although not himself a physician, yet he was more successful in treating the plague than any of the physicians where he went. Howard's opinion therefore on such a subject is of the highest value.—“The abstemious diet which, at an early period of his life, he adopted from a regard to his health,” says his biographer, “he afterwards continued, and increased in its rigor from principle, and from choice, as well as from a conviction of the great advantages which he derived from it.” And after all his experience, near the close of his life, he made the following record in his diary. “I am firmly persuaded, as to the health of our bodies, that herbs and fruits will sustain nature, in every respect far beyond the best flesh.” Yet with all the practical good sense and wisdom of this philanthropic man, there is every reason to believe that he fell a victim to his free use of tea. Substituting its deleterious stimulation for the sustaining nourishment of food, he rushed with the utmost temerity into the presence of the greatest danger, when his body, by fatigue, cold, wet, and exhaustion from severe fatigue, was wholly unprepared to resist the virulent action of malignantly noxious agents, and then neglected the early symptoms of disease in his system, and perseveringly refrained from the use of any efficient means of restoration.

§ 1088. The distinguished botanist Charles Whitlaw, speaking of the ravages of the yellow fever in New York, says, “I was then in the full vigor of health, having been brought up on a vegetable diet, which I have no doubt was the chief cause of preserving my health and life, as I

attended and nursed a considerable number during the whole of their illness without taking the fever. Being anxious to know the cause of the dreadful malady, I attended the dissections. The doctors were astonished how I escaped the contagion. Mr. Hardy, a celebrated Scotch philanthropist, like Howard, went from place to place in the city, administering comforts to the diseased and miserable. I was induced to follow his course. It would be impossible to describe the distress I witnessed."

—Mr. Whitlaw also informs me that he spent a season in New Orleans during the prevalence of the yellow fever, and was much among the sick, nursing and administering to them, and by virtue of a pure and simple vegetable diet he wholly escaped an attack of the fever.

§ 1089. Copeland's Medical Dictionary contains an article on climate in relation to the food of man, in which the writer says—"When travelling in the most unhealthy parts of intertropical Africa, in 1817, I met with an Englishman who had lived there between thirty and forty years, and was then in the enjoyment of good health. The circumstance was singular; and in answer to my inquiries as to his habits, he informed me that soon after his removal to that pestilential climate, his health had continued to suffer, till, after trying various methods without benefit, he had pursued as closely as possible, the modes of life of the natives, adopting both their diet and beverages—(the natives living almost exclusively on rice and maize, and water;) and from that time he had experienced no serious illness."

§ 1090. The Rev. Mr Mylne, missionary to Africa, makes the following mention of the health of his colleague, the Rev. Mr. Crocker. Having given an account of his own severe sickness and recovery, he adds—"Brother Crocker has been very much favored; he has had no

real attack of fever all this time; which I suppose is unprecedented for a white man here; but he began three months before leaving America, to live on farinaceous food, and has strictly adhered to his principles since he arrived; living on rice, cassada, sweet potatoes, &c.—a fact worthy of the consideration of emigrants to this country."

§ 1091. Mr. G. W. M'Elroy, of Kentucky, visited Liberia in Africa in the summer of 1835—arriving in July. He spent two months in Monrovia, and two months on the coast. During his voyage to Africa, while there, and on his passage home, he abstained wholly from animal food;—lived on rice and other farinaceous vegetables, and on fruits. He enjoyed the best of health the whole time, (although much exposed while in Africa;) and in fifty-seven days he gained fifteen pounds in weight.

§ 1092. But the most signal demonstration of the truth of the principles which I am contending for, was afforded in the city of New York during the prevalence of the cholera in the summer of 1832. The opinion had been imported from Europe, and generally received in our country, that a generous diet embracing a large proportion of flesh-meat, flesh-soups, &c. with a little good wine, and a strict abstinence from most fruits and vegetables, were the very best means to escape an attack of that terrible disease. Nearly four months before the cholera appeared in New York, I gave a public lecture on the subject in that city, in which I contended that an entire abstinence from flesh-meat and flesh-soups and from all alcoholic and narcotic liquors and substances, and from every kind of purely stimulating substances; and the observance of a correct general regimen in regard to sleeping, bathing, clothing, exercise,

the indulgence of the natural passions, appetites, &c. &c. would constitute the surest means by which any one could rationally hope to be preserved from an attack of that disease. I repeated this lecture after the cholera had commenced its ravages in the city, and notwithstanding the powerful opposition to the opinions which I advanced, a very considerable number of citizens strictly adhered to my advice. And it is an important fact, that of all who followed my prescribed regimen uniformly and consistently, not one fell a victim to that fearful disease, and very few had the slightest symptoms of an attack.* The following statements which were received from respectable individuals soon after the disease had disappeared from the city, may be relied on with the fullest confidence.

a. "In stating my views of a simple diet," says Dr. Amos Pollard, "as a means of preserving health and preventing disease, I must necessarily be brief for want of time. I think I have the most ample evidence of its salutary and conservative effects in my own person. I had been afflicted both before and during my medical studies, with the worst of diseases, chronic dyspepsy, from which I never obtained any permanent relief, until

* During the prevalence of the cholera in New York in 1832, it was most extensively, clamorously and continually asserted that the "Grahamites" were dying by scores with the epidemic, and this opinion has gone abroad through the country and is perhaps generally believed. Yet I solemnly declare that I made the most diligent search in every part of the city where any such case was reported, and called on every physician who I heard had made such assertions—and in the newspapers of the city publicly called for the specification and proof of such cases, yet I could not find a single instance in which an individual who had adopted and consistently observed the regimen I had prescribed, had died of cholera or any other disease, and but two or three instances in which there had even been a slight attack; and in each of these cases there had been decided imprudence.

about eighteen months since, when I put myself on the simple mode of living recommended in your Lectures. For nearly a year, I subsisted principally upon coarse wheat-meal bread and milk with great advantage to my health;—when happening to get some milk which tasted and smelted of garlies, I became so disgusted with it that, in May last (1832) I exchanged my milk for spring water, which with the coarse bread has constituted my diet, mainly, ever since. During the past summer, and especially the cholera season, my professional duties were exceedingly arduous; and I often felt myself nearly worn out for want of rest and sleep. Yet through the whole sickness, I subsisted on one pound per day of coarse, unleavened wheat-meal crackers, with some fruit and spring water; and experienced no disorder of the stomach or bowels, but enjoyed, and still continue to enjoy far better health than I have experienced before for the last fifteen years. I also gained several pounds in weight during the cholera season. On looking over my notes of cholera cases, taken at the bedside of the patients, I find that the occasion of the disease could be traced, in a very large majority of cases, either to confirmed habits of intemperance, or to some prominent act of imprudence. I speak here of patients both in hospital and in private practice. Many people—and among them, some of my own profession—have asserted that, simple vegetable diet is conducive to, and in many cases has actually produced cholera. I have taken considerable pains to investigate these matters, and in not a single instance have I been able to verify their assertions;—but on the contrary, I have uniformly found that every person who has strictly and judiciously observed such a diet under a well-regulated general regimen, has not only escaped the cholera, but enjoyed excellent general health."

b. "After having been grievously afflicted for several years with dyspepsy," says Mr. A. Woodman, "I adopted a simple, vegetable diet, and entirely recovered my health. Through the cholera season, I subsisted almost entirely on coarse wheat-meal bread and water, and enjoyed the most perfect and uninterrupted health, and gained several pounds in weight. Our family, consisting of ten members, who lived on what the physicians call a more "generous diet," of flesh, fine bread, tea, coffee, &c. all had a pretty severe attack of cholera; and some of them two and some three attacks.—My brother David, a very healthy and robust young man, who lived as the rest of the family did, but used no spirits, went with me three several times through the cholera hospitals, to see the sick, and during the night following each time, he had a severe attack of cholera, while I had not even a premonitory symptom of the disease through the season."

c. "Myself, wife, and sister," says Mr. Evander D. Fisher, "had all been afflicted with poor health, and particularly my wife and sister, for many years before we adopted our present mode of living on simple vegetable food. Neither of us has eaten any flesh since;—which is now more than a year. We spent the past summer in the city, and never enjoyed better health than we did through the whole cholera season. That dreadful disease raged terribly all around us, and cut off many of our neighbors, and even came into our house and attacked our mother, who did not live as we did, but ate flesh, &c.;—and I was amongst the dying and the dead, and assisted in laying out and putting into their coffins at least a dozen dead bodies of those who had died of cholera, yet neither myself, wife nor sister, had the least premonitory symptom of cholera nor any other illness during the whole season."

d. "We remained in the city during the cholera season last summer," says Mr. William Mitchell, "and living near one of the cholera hospitals, we daily saw the dying and the dead carried by our door. Our whole family except my mother, subsisted entirely on a simple vegetable and milk diet. My mother thought she required the more *generous diet* to which she had always been accustomed, and continued to eat flesh and live in the usual mode. She had a very severe attack of the cholera, while the rest of us had not a symptom, but enjoyed the best of health through the whole season."

e. "Four members of our large family," says Mrs. Pike, "lived strictly on a simple vegetable diet, during the cholera season, last summer,—eating no flesh and subsisting principally on coarse wheat-meal bread. They enjoyed excellent health, and none of them had the slightest symptom of cholera during the season: while every other member of the family had more or less of that disease."

f. "During the prevalence of the cholera last summer," says Mrs. Harriet Wheeler, "all of our family had an attack of that disease, except myself. They ate flesh and lived in the usual manner. I ate no flesh, but lived strictly on a simple vegetable diet, consisting principally of coarse wheaten bread. But what, in all probability, would have been my case, if that awful epidemic had found me in that condition of body, in which I was before I adopted my present mode of living! I verily believe I should not now be among the living on earth. Thanks to God, I am not only living, but well. I have scarcely known an hour's indisposition during the past twelve months. And what a change is this, after having been afflicted as I have been for more than twenty years."

g. "Since about the year 1818," says Mr. Ferdinand L. Wilsey, "I have been afflicted with very feeble health. In the autumn of 1831, I commenced living on a simple vegetable diet; and continued to live in this manner very strictly during the cholera season, subsisting mainly on coarse wheaten bread. My health improved very much, and continued good through the summer. With a medical friend I attended many cases of the cholera, and stood over several patients and administered to them and rubbed them, but had not a symptom of the disease; while my medical friend, who ate flesh and drank wine, and urged me to, had several attacks."

h. "Myself and wife," says Mr. Edmund Van Yorx, "had long been in very feeble health, and laboring under many serious symptoms of pulmonary consumption, when we adopted a simple vegetable diet:—since which time our health has improved exceedingly. We and our children and other members of our family spent the cholera season in the city, all living strictly on our plain vegetable diet. Our immediate neighborhood was exceedingly sickly. The cholera raged all around us, and the people died on every side of us. One man died next door, so near to us, that I could reach my hand out of my window into his room; and the offensive smell of his body after death, came in and scented our whole house; and yet none of us had any thing of the disease. I have two apprentices, both of whom lived as we did on a vegetable diet through the worst of the cholera season, without the least indisposition. The older one then went into the country where he spent two weeks, living quite generously on animal food, &c., and then returned to the city and took the cholera immediately; and had three physicians to keep him alive. The younger one continued in the city adhering closely to his simple vegetable

diet. His health improved very much indeed during the summer, and he had not the slightest symptom of cholera nor any other disease."

i. "After having been afflicted with miserable health for many years," says Mr. David I. Burger, "I was induced to adopt a plain and simple vegetable diet, and by degrees, became more and more strict in my regimen, till I got on to a diet of coarse wheaten bread and pure rain-water exclusively. This regimen I observed rigorously through the whole cholera season, and not only became wholly relieved from all my ailments, but recovered and enjoyed the most entire and perfect health,—feeling strong, active, and cheerful. My sleep was as sweet as an infant's; and when I rose in the morning, I always felt fresh and clear and vigorous and sprightly, as I ever did in my boyhood. During the cholera season, I was very much among the sick of that terrible disease. Several times a day, I visited a family occupying a house belonging to me in James Street, and of which five members died. I stood over the beds of the sick,—handled their bodies—assisted in taking care of them, &c., and after the house was deserted, and others were afraid to enter it, I went into it, took up the beds, clothes and other things appertaining to the rooms from which the dead bodies had been removed, and carried them out of the house, and was three or four times a day there, handling the things, &c.—After this, I visited several other families who were sick of the same disease,—sat beside the sick by the hour, watched with them, rubbed them, lifted them, &c.; yet through the whole season I had not the least touch of the complaint, nor the slightest indisposition of any kind.

j. Benjamin Tytler, an aged Scotchman in the employ of Daniel Fanshaw, Esq., living on the simple vegetable

diet, purposely exposed himself in almost every possible way,—frequenting the most infected parts of the city, but had not a symptom of the disease.

k. William Goodell, Esq., Editor of the Genius of Temperance, who had been for many years afflicted with chronic diarrhoea, was relieved by a simple vegetable diet, and was much exposed during the cholera season, but wholly escaped an attack.

l. James Whitelaw, a Scotch gentleman, had been afflicted in the same manner and recovered his health by the same means. He was daily in the midst of the cholera but had not a symptom himself.

m. Mrs. Phebe Corlies, an excellent member of the society of Friends, had been most severely afflicted for thirty years with a chronic diarrhoea which had baffled every mode of medical treatment. She was relieved by a simple vegetable diet and correct general regimen, and enabled to remain in the city through the cholera season without a symptom of that complaint.

n. Two sisters by the name of Primrose, had been out of health, and both recovered excellent health by adopting a simple vegetable diet and a correct general regimen. The older sister returned to her tea, coffee, flesh-meat, &c.,—but the younger continued to adhere closely to her vegetable diet. During the prevalence of the cholera, the older sister was severely attacked and but just escaped with her life, while the younger sister nursed her—stood over her night and day, administered all her medicine, rubbed her body, took her breath, and even put her mouth to hers and kissed her when in a state of collapse, and yet had not a symptom of the disease, nor any indisposition during the whole season.

o. William Cooke, wife and children, living strictly on a simple vegetable diet, enjoyed the best of health through

the cholera season, without having a symptom of that disease: while a young woman residing in the same family and eating flesh and living in the ordinary manner had three severe attacks.

p. Dr. D. M. Rees, whose practice and success were at least equal to any other physician's in New York, declares that when the cholera broke out in that city and he was called to practise among it, he found that the disease was making its greatest ravages amongst the excessive flesh-eaters, and he consequently went home and requested his family to abstain entirely from the use of flesh during the continuance of the epidemic in the city, and he and his family subsisted wholly on a vegetable and milk diet while the cholera prevailed, without having any thing of the disease:—excepting in one instance, near the close of the sickness, when Mrs. R. without his knowledge, partook of flesh-meat, and in a few hours after was taken with diarrhoea.—Precisely the same thing happened to Mr. Henry R. Piercy and his wife:—and Dr. Rees says that he advised all his friends to abstain from flesh, and that all who conformed strictly to his advice wholly escaped the disease.

q. Dr. Tappan, who superintended the Park Hospital, has assured me that out of twelve house pupils (students of medicine and young physicians) who assisted him in the Hospital during the prevalence of the cholera, Mr. Sharrock, who had lived more than a year, very strictly on a simple vegetable diet, was the only one who entirely escaped all symptoms of the disease; all the others being attacked more or less violently, and some quite severely.

r. "My health was very feeble and I had suffered much from hemorrhage of the lungs," says Mr. Lewis St. John, of New York, "when I was induced, in the

spring of 1832, to adopt a simple vegetable diet. From this change I almost immediately experienced considerable benefit; and during the prevalence of the cholera in the city, I not only escaped all symptoms of that disease, but enjoyed much better health than usual. Being still feeble however, and dreading the effect of our northern winter, I left New York for Mobile, by water, in the fall of 1832. About forty other gentlemen left New York with me, in the same ship for the same place. We were shipwrecked on an island in the Gulf of Mexico, about half way between Key West and Havana; or ninety miles from the latter place. We remained on this island fourteen days: and were then taken off (sixty-five of us in all) and carried to Mobile in a schooner of sixty-seven tons. About one week after my arrival at Mobile, the cholera broke out there, and even came into the house where I boarded, but I had no symptom of it. I took no other precaution to avoid it except to adhere strictly to my simple mode of living, and washing every morning. I remained in that climate nearly four years. Of the forty gentlemen who went out with me, every one was sick more or less within the first year, and some of them died; and within three years from the time of our arrival, a number of them died and many more of them were sick a great deal, and apparently came very near dying. Some of the most healthy and robust of the company were cut off in the vigor of manhood and the prime of life, and I followed them to the grave. Yet during my whole stay in Mobile, I enjoyed continually improving and uninterrupted health, and paid nothing for physic or physician. In the spring of 1836 I returned to the North with health wonderfully improved. While travelling in the month of August of the same year, not finding it convenient to adhere to my simple diet, I yield-

ed to the exigency of circumstances, and lived as others did at the hotels and other places where I stopped. This brought on a pretty severe turn of bleeding at the lungs, which laid me up for a fortnight. The physician who attended me was very much surprised that my system was so little affected by the hemorrhage and recovered so soon, and declared that he never before saw such a case. After this I found that any considerable departure from my simple mode of living was sure to admonish me with symptoms of my old complaint: but for the last fifteen months my habits have been regular, and I have had no bleeding;—my general health is very much improved;—my lungs are stronger than they have been before for ten years, and my body is very vigorous.—About three months since, as a matter of experiment, I drank one cup of what is called good coffee.—Having been out of the habit of drinking it for many years, it operated powerfully as an emetic in fifteen minutes. When I had vomited freely I felt perfectly well again.”

§ 1093. I might continue to multiply cases of this kind to a very great extent, but I have already given enough to satisfy every unprejudiced mind, that a well-chosen vegetable diet is better than a mixed diet of vegetable and animal food, to enable the human body to resist the action of foreign morbid and pestilential causes.

§ 1094. From the principles and facts already advanced, it appears too evident to require much further reasoning to prove that a pure vegetable diet, as a general rule, is better adapted to assist the diseased body in recovering health, than flesh-meat or than even a mixed diet of animal and vegetable food.

§ 1095. It is possible that in some instances, pernicious principles in the atmosphere or other foreign agents acting on the system through the lungs or through the cu-

taneous organs or functions, may be the principal causes of disease. But as a general fact, these causes are mainly adventitious or supplementary—coming in to prostrate the system which was previously poising to its fall, and as it were, to give a determinate direction and unity of effect to the co-operation of many other causes.

§ 1096. In general therefore, the predisposing,—and for the most part, the immediately exciting causes of disease in the human body, are to be found within the precincts of man's dietetic and other voluntary habits and actions: (§ 1082.) and probably, his dietetic errors are by far the most extensive source of his disease.

§ 1097. Whether we embrace the scheme of humoral pathology or either of the other two which have been named, (§ 1071.—1073.) we must admit that, as a general fact, organic irritation, disturbing the functions and deteriorating the functional results and inducing a morbid condition of the solids, (§ 1077.) leading to acute and chronic inflammation, general fever, local disease, change of structure, &c. &c. is the ordinary source of our diseases: and these irritations are produced by the dietetic use of substances unfriendly to vitality and to the physiological interests of our bodies; and by the improper qualities and quantities and conditions of our food; and by many other means and circumstances pertaining to our dietetic and other voluntary habits and actions. (§ 520.) But, by whatever cause induced, disease, when once established in the system, can only be removed by the constitutional economy of the living body,—by the healthy functions of the several organs. Yet so long as irritation is kept up the healthy functions of the organs cannot be restored.

§ 1098. The only aid therefore, that human skill and science can afford the diseased body in recovering health,

is, with strict regard to the physiological properties and laws of the system, to assist it, as far as possible, in throwing off oppressions, removing obstructions and all irritating causes, and in subduing irritations, and restoring healthy action and function. And in order to this, it is requisite, in the first place, that the physician should well understand the physiological powers and laws of the body:—in the second place, that he should understand the nature of the disease:—and in the third place, as a general rule, that he should fully and clearly ascertain the cause of the disease. For, as Hippocrates justly observes, “the man who attempts to cure a disorder without knowing the cause, is like a blind man, or one groping in the dark;—he is as likely to do harm as good.”

§ 1099. It is true that there are some instances of acute disease, in which the symptoms are so violent that the physician cannot safely delay his practice, to investigate the case extensively, and ascertain obscure, remote and accumulative causes, before he endeavors to subdue the violent symptoms and mitigate the sufferings of his patient. But as a general rule, even in acute disease, the physician acts not wisely who prescribes a remedy before he has carefully inquired after the cause. For, all he does without a knowledge of the cause, is necessarily groping in the dark: he may relieve or he may aggravate the symptoms with equal credit to his skill and science. So far as his agency is concerned, it is a pure contingency, whether he kills or cures. Thus, to state a real case, (§ 597.) a physician is called to a patient laboring under violent delirium;—without inquiring carefully after the cause, he treats the case according to his view of the symptoms, and bleeds copiously, and rapidly reduces the patient, without mitigating the symptoms in the least:—another physician is calle

taining the cause; this done, an emetic is prescribed, and soon a large quantity of undigested beef and pickled cucumbers, is thrown from the stomach, and instantly the symptoms disappear and the patient is restored to reason, and shortly to health. Had the first physician in this case, continued his practice, he would surely have killed his patient. Cases of this kind are continually occurring in society; and the effects of the mal-practice are always attributed to the incorrigibleness of the disease, and mankind rest satisfied, in their ignorance and unbounded credulity.

§ 1100. In chronic disease, all practice which is not based upon a careful and thorough investigation of the causes, as well as the symptoms of the case, is in fact, nothing but downright quackery; and far more frequently does harm than good. For in such practice, the causes of the disease, existing in the dietetic and other voluntary habits of the patient, (§ 1077.) are suffered to remain and constantly exert their morbid influence by which the disease was originally induced, and continues to be perpetuated. Nay indeed, those very causes are frequently employed as remedial agents to remove the disease which they have originated and are perpetuating. Thus I have in multitudes of instances, seen people who had been severely afflicted for years, by diseases which were principally induced by the habitual use of alcoholic and narcotic substances, and which had been kept alive by the continued use of those substances as medicine:—and all that was necessary to remove the diseases and restore the sufferers to health, was to take away their medicine. Again, I have seen instances in which individuals had suffered under the most cruel affections of the heart and head and other parts, and submitted to medical treatment for t on taking away their tea

and coffee, which were the principal, originating and perpetuating causes of their sufferings, they were soon restored to perfect health. But the practitioners had wholly overlooked or entirely disregarded these causes, and suffered them to keep alive the symptoms which they were combating with their medicine; and by their medicine rendering their patients only the more morbidly susceptible to the effects of those morbid causes. And I have seen hundreds of miserable dyspeptics, who had suffered almost every thing for years,—scores of those whose symptoms strongly indicated pulmonary consumption—and sometimes apparently in its advanced stage,—many who had been for years afflicted with epileptic and other kinds of fits and spasmodic affections,—or with cruel asthma, or sick-headache,—in short, I have seen nearly every form of chronic disease, with which the human body is afflicted in civilized life, after resisting almost every kind of medical treatment for months and years, yield in a very short time, to a correct diet and well regulated general regimen. And why was all this? Because, in almost every case the diseases had been originated and perpetuated by dietetic errors; and the practitioners had been unsuccessful, because with all their administration of medicine, they had suffered those dietetic errors to remain undisturbed, unquestioned—nay, perhaps even recommended.

§ 1101. Hippocrates, who possessed one of the most powerful and discriminating minds ever devoted to medicine, depended mainly on regimen for the cure of disease. His first business was to ascertain the character of the disease,—then the cause or causes; and then he proceeded to remove, as far as possible, all extrinsic or external causes, existing in dietetic habits, &c., and if he found internal causes requiring medicine for their removal, he

gave medicine. But his materials of medicine were few and simple, and only used to a very limited extent.—In fact, as I have already said, (§ 1078.) a free and continued use of medicine in almost every case, only evinces a want of true skill and science in the practitioner.—It is indeed, the appropriate business of the quack to drug mankind to death: and the enlightened and philanthropic duty of the physician, to assist nature in strict accordance with her own fixed laws. In chronic disease, at least, but little medicine can be given, without doing more harm than good. A single dose or two, or a few doses at most, to remove obstructions and prepare the way for a correct regimen, is, as a general rule, all that can be wisely used: and whatsoever is more than this is evil.

§ 1102. The great question is, how to remove all irritation from the system, and restore each part to healthy action and condition. But almost all the articles of medicine, not excepting those called tonics, are either directly or indirectly irritating and debilitating in their effects on the living body; and therefore, should be avoided as far as possible. Many of the articles of diet ordinarily used in civilized life, are also decidedly irritating and pernicious: and many of the modes of preparing food, are sources of irritation to the system. In fact, when the body is seriously diseased, even the necessary functions of alimentation, under the very best regimen, are, to a considerable extent, the sources of irritation:—and were it possible to sustain life without nutrition, entire and protracted fasting would be the very best means in many cases, of removing disease and restoring health. I have seen wonderful effects result from experiments of this kind. But nutrition must be sustained; and the grand problem is how it can be sustained to the necessary extent, with the least degree of irritation to the

diseased parts, or with the least possible increase of diseased action. In solving this problem, the physician requires the aid of profound science. It is necessary that he should thoroughly understand the physiological properties and laws of the human body, and its constitutional relations, and the qualities of alimentary and medicinal substances in relation to the organization and to the vital properties and powers of the body. With such scientific qualifications, with sound judgment and mature experience, he will be able to adapt his regimen to the particular condition of his patient,—to remove, as far as possible, every irritating cause, in the quality, quantity and condition of the diet, and to retain only such articles as will afford sufficient salutary nourishment, with the least degree of irritation and excitement; while at the same time, it is best adapted to promote the particular and general functions of the alimentary and other organs of the system.

§ 1103. Such a physician, if he gives his mind fully to the subject, will discover in the course of a few years, at longest, that though in particular cases, where individuals have long been accoustomed to a free use of animal food, it may be inexpedient to make too sudden and entire a change of diet, and though great improvements may be made in health, on a plain and temperate mixed diet, and in some instances, the patient may increase in flesh and strength most rapidly, for a season, on animal food, yet as a general fact, however well ordered his regimen in other respects, if he retains any portion of flesh-meat in the diet of his patient, he in some measure retards, if he does not prevent, his complete restoration to perfect and permanent health. He will find that it is much more stimulating in proportion to the quantity of nourishment which it actually affords the system, and consequently

causes a greater exhaustion of the functional powers of the organs of assimilation and nutrition, than pure and proper vegetable food, (§ 916.)—that it always increases the general excitement and diseased action of the system, and tends to perpetuate its morbid irritability and susceptibility; and produces fluids and humors, less bland and genial to the solids, (§ 690.) and in all respects less adapted to promote the prophylactic and sanative process of the vital economy.

§ 1104. The celebrated Dr. Cheyne, of England, who flourished about a hundred years ago, says—"For those who are extremely broken down with chronic disease, I have found no other relief than a total abstinence from all animal food; and from all sorts of strong and fermented liquors. In about thirty years' practice, in which I have in some degree or other, advised this method in proper cases, I have had but two cases in whose total recovery I have been mistaken: and they were both too deeply diseased and too far gone for recovery before I undertook with them."—Dr. Lambe, of England, now upwards of seventy years old, after a very long, extensive and successful practice, speaks most decidedly against the use of animal food of any kind in chronic disease.—And during the last seven years, my own opportunity to prove the virtues of different kinds of diet in chronic disease, has probably been more extensive than that of any other individual in any age; and I have, as a general rule, always found that a pure and well-regulated vegetable diet, under a correct general regimen, is decidedly better than that which contains any portion of animal food. I have, it is true, met with some invalids, whose general physiological condition seemed to require that a portion of animal food should be retained in their diet for a few weeks and perhaps a few months, till the general slug-

gishness and torpor of their systems could be overcome; but such cases are not common; while on the other hand, as I have already stated, (§ 1100.) I have seen multitudes of chronic diseases of every name and type, which had long and incorrigibly withstood medical treatment of every kind, yield,—in some instances, immediately, and in others, in a few weeks or months, to a pure vegetable diet, and general regimen regulated by physiological principles. I could fill a large volume with well-authenticated and most interesting, detailed accounts of a very great variety of cases of chronic disease, cured in this manner. But this is not the place for such a detail.

§ 1105. In regulating the diet of chronic patients, however, it should always be remembered that the extensiveness and suddenness of any change should correspond with the physiological and pathological condition and circumstances of the individual: and most especially should it be remembered that **THE DISEASED ORGAN OR PART SHOULD BE MADE THE STANDARD OF THE ABILITY OF THE SYSTEM.** If the boiler of a steam-engine is powerful enough in some parts, to bear a pressure of fifty pounds to the square inch, while in some other parts, it can only bear ten pounds to the square inch, we know that it would not do for an engineer to make the strongest parts of the boiler the standard of its general ability or power, and to attempt to raise a pressure of forty pounds to the square inch, because some parts can bear fifty pounds:—for in such an attempt, he would surely burst the boiler at its weakest parts. He must therefore, make the weakest parts the standard of the general power of the boiler, and only raise such a pressure of steam as those parts can safely bear. So he who has diseased lungs or liver or any other part, while at the same time he has a vigorous stomach, must not regulate the quality

and quantity of his food by the ability of his stomach, but by the ability of the diseased part. This rule is of the utmost importance to the invalid, and one which cannot be disregarded with impunity, and yet it is continually and almost universally violated. Few things are more common than to find individuals, who are laboring under severe chronic disease, indulging in very improper qualities and quantities of food and other dietetic errors, and still strongly contending for the propriety of their habits and practices, on the ground that "*their stomachs never trouble them.*" Alas! they know not that the stomach is the principal source of all their troubles: (§ 521.) yet by adopting a correct regimen and strictly adhering to it for a short time, they would experience such a mitigation of their sufferings, if not such a restoration to health, as would fully convince them of the serious impropriety of making a comparatively vigorous stomach the standard of the physiological ability of a system otherwise diseased.

§ 1106. Another equally common error of opinion, is that the fleshiness and the muscular power of the body are to be considered as criteria of the excellence of any regimen prescribed for a chronic invalid. Every intelligent person knows that, when an individual is taken with an acute disease of a highly inflammatory character, the physician cuts off all food at once, and adopts a course of treatment which rapidly reduces his strength and flesh; because it is believed that there is no other way of arresting the progress of the disease and preventing fatal consequences, but by greatly reducing the general action of the vital powers:—for always, when the action of the vital powers is diseased action, the more violent it is, the sooner will it destroy the vital constitution of the diseased part or parts, and the more speedily will it break up the vital economy of the system. But the

main difference between acute and chronic disease, is in the *degree* of the morbid activity of the vital powers: and if we would not indulge in “a generous diet of highly seasoned flesh-meat, rich pastry, wine, &c. when laboring under acute inflammation of the pleura, lest we should destroy life by the violence of a general fever, and the mortification of the inflamed part, with what propriety can we indulge in such a diet, when laboring under a chronic inflammation of the same or any other part, since the chronic inflammation as certainly tends to change of structure as the acute, though with less rapidity and violence;—with less rapidity, because the morbid activity of the vital powers is less excessive, and with less violence, because the conservative economy of the system makes less resistance to the progress of the disease, (§ 1077.) but, as it were, more quietly succumbs and suffers the enemy with stealthy death-tread, to march perhaps unsuspected, into the citadel of life. (§ 739.) Nevertheless, the chronic invalid himself, and generally his friends, and sometimes also, his physician seem to think that fleshiness and muscular strength, are the things mainly to be desired and sought for, and that any prescribed regimen is more or less correct and salutary, in proportion as it is conducive to these ends. Whereas if they were properly enlightened, they would know that the more they nourish a body while diseased action is kept up in it, the more they increase the disease. The grand, primary object to be aimed at by the invalid, is to overcome and remove diseased action and condition, and restore all parts to health, and then nourish the body with a view to fleshiness and strength, as fast as the *feeblest parts* of the system will bear, without breaking down again. And the regimen best adapted to remove the diseased action and condition, more frequently than

otherwise, causes a diminution of flesh and muscular strength—while the disease remains—in regulating the general function of nutrition to the ability of the diseased part. (§ 1105.) But when the diseased action ceases, and healthy action takes place, the same regimen perhaps, will increase the flesh and strength as rapidly as the highest welfare of the constitution will admit.

§ 1107. Some invalids, after trying the virtues of medicine and generous living for many years, with a continual increase of their sufferings, have adopted a simple vegetable diet and severe general regimen, and very soon experienced a great alleviation of their distress, and in the course of a few months, an entire removal of their disease, and a restoration of the healthy action and condition of every part. But at the same time, and by the same means, they have also experienced a great diminution of flesh and muscular strength; and believing that there can be no health without these, and having neither faith nor patience to wait for the more slow and safe effects of a mild, unstimulating diet, they have, after subduing their disease by their abstemious regimen, returned to the use of flesh-meat and to a generous living, and, for a while, increased in flesh and strength with great rapidity; and of course, believed that their restoration to health was wholly attributable to their generous diet; and that if they had persisted in their abstemiousness, it would surely have killed them.—It is strange that such people can so soon forget that, before they adopted their abstemious regimen, all the animal food and wine and medicine they could swallow, failed to give them flesh or strength; but on the contrary, only increased their sufferings. This however, is but one of the innumerable delusions with which mankind are cursed: and happy is it for them, if it does not soon lead them into deeper and more

inextricable difficulties than those from which they have been relieved.

Diet with Reference to Longevity.

§ 1108. Concerning the comparative effects of animal and vegetable food in prolonging human life, the principles which I have already explained, (§ 683.—689. 919. 926. 975.) and the facts which I have presented, are such as to leave little necessity for physiological discussion and demonstration in regard to this point.

§ 1109. There is no more general and invariable physiological law appertaining to the animal kingdom, and, indeed, to the whole organic world, than this. (§ 975.)—The more slowly the healthy and complete vital functions are performed—the more slowly living bodies are developed and attain to maturity, the longer will be the natural duration of life. (§ 688.) It is admitted by all eminent physiologists, that *intensive* and *extensive* life are incompatible. “The more slowly man grows,” says professor Hufeland, “the later he attains to maturity and the longer all his powers are in expanding, the longer will be the duration of his life,—as the existence of a creature is lengthened in proportion to the time required for expansion. Every thing therefore, that hastens vital consumption, shortens life; and consequently, the more intensive the vital action, the shorter the life.” (§ 1000.) We have seen that the human body is formed from fluids, (§ 146.) that in early childhood all the solids are exceedingly pulpy and moist, (§ 684.) that the proportion of the fluids to the solids is very great—more than ten to one—and that as life advances, even under the most favorable circumstances, the relative proportion of the fluids gradually diminishes, and that of the solids increases; (§ 688.)

and, at a certain period, depending in a measure on the general habits of the individual, all the solids begin to be less pulpy and to become more dry, inflexible, inelastic and unyielding,—producing the various phenomena of old age. (§ 998.) We have seen also, that this change in the relative proportion of the fluids and solids, may be effected more slowly or rapidly, according to the dietetic and other voluntary habits of the individual: (§ 690.)—and moreover, that a change in the relative qualities and conditions of the fluids and solids, may be very rapidly effected by dietetic and other voluntary errors, causing irritation and disease, and bringing on premature old age, with a thousand-fold more decrepitude and infirmity, than are incident to the most extreme natural old age. (§ 691.)

§ 1110. All alcoholic liquors of every kind, distilled and fermented,—all narcotic substances, fluid and solid, (§ 973.) all pure stimulants, or those substances which stimulate without nourishing the body, (§ 743.) all improper quantities and qualities of food,—all pernicious preparations and conditions of aliment,—all inordinate exercise of the passions, in short, all things that produce over-excitement and irritation in the system, increase the intensity of life, hasten the changes in the relative proportion, qualities and conditions of the fluids and solids of the body, and shorten the period of its existence.—Hence professor Hufeland very justly observes,—“If you would live long, live moderately, and avoid a stimulating, heating diet; such as a great deal of flesh, eggs, chocolate, wine and spices.”

§ 1111. I do not however, intend to class flesh with alcoholic and narcotic and other intoxicating and stimulating substances, as equally pernicious to the physiological properties of the human body; but I simply intend to compare it with a pure, well-ordered vegetable diet.—

And here again, (§ 1085.) I acknowledge that an exclusively vegetable diet, with every other circumstance unfavorable to life, will not sustain human existence so well and so long as a mixed diet of vegetable and animal food with every other circumstance favorable to longevity. The Hindoos for instance, subsist mostly on vegetable food; but as we have seen, (§ 1031.) they always eat with that food, an excessive quantity of stimulating, heating and irritating spices. And from the highest to the lowest—males and females—old and young—from morning till night, they smoke a composition containing opium; and almost every man, woman and child habitually, and often to a very great excess, chews a cud composed of opium, lime and betel-nut, wrapped up in a sera-leaf of very acrid and pungent qualities. The properties of the betel-nut are too sharp and violent to be borne without being qualified by the arec-nut and a little lime. Tobacco, one of the worst of narcotics, and arrack, a very intoxicating, fiery and destructive alcoholic liquor are also in common and excessive use among them. They marry at twelve, and even ten years of age,—are unboundedly licentious, indolent and inactive; and their climate is by no means the most favorable to long life. Is it strange then, that such people should afford comparatively few instances of longevity?—Yet it is common for the Bramins of India, who are strictly temperate and of correct general habits, to attain to a hundred years. (§ 796.)

§ 1112. In comparing the effects of vegetable and animal food on the human body, with reference to long life, therefore, the simple question is whether—all other things being precisely equal—flesh-meat is as conducive to longevity in man as a well-chosen and well-ordered vegetable diet:—and to this question I affirm that, both physiological science and fact fully and unequivocally answer no!

§ 1113. As I have repeatedly stated (§ 916.) and as every physiologist must admit, flesh is always of a more stimulating and heating nature, causes a more rapid pulse, (§ 919.) a hotter skin,—hastens all the vital functions of the body, (§ 924.) causes a greater exhaustion of the vital powers of the organs, and wears out the human constitution considerably faster than a proper vegetable diet. Hence, great longevity is never found among those tribes and portions of the human family who subsist principally or entirely on animal food, or flesh-meat. The Patagonians, with a climate and almost every other circumstance except their diet, exceedingly favorable to longevity, rarely attain to seventy years of age: and the average duration of life is greater with them than with any other flesh-eating tribe or nation. (§ 981.)

§ 1114. We have already seen (§ 779.) that, according to all history and tradition, the primitive inhabitants of the earth subsisted entirely on vegetable food, and lived to a very great age. (641.) The ancient Chinese, who subsisted on rice and water, are said to have been remarkable for their great longevity. "The Pythagoreans who lived on a simple vegetable diet," says Hufeland, "afforded the most numerous instances of old age."—"The Essenes, as we call a sect of ours," says Josephus, "live the same kind of life as do those whom the Greeks call Pythagoreans. They are long-lived also, insomuch that many of them live above a hundred years, by means of their simplicity of diet, and the regular course of their lives." (§ 797. 798.)

§ 1115. In fact, it is true of those portions of all the ancient tribes and nations, who preceded the period of luxury, (§ 648.) and who subsisted, on a plain, simple, coarse and natural diet of vegetables, fruits, and water, that they possessed great bodily vigor, and lived to a very great

age, exempt from most of the diseases of body and mind, which so abundantly afflict the luxurious and the intemperate. "It has been established by nature on the best grounds," says Hufeland "that, our nourishment should be used in a form rather coarse;—securing full mastication and insalivation and a longer retention in the stomach.—Plain, simple food only, promotes moderation and longevity; while compounded and luxurious food shortens life." "The most extraordinary instances of longevity," continues Hufeland, "are to be found among those classes of mankind, who, amidst bodily labor, and the open air, lead a simple life agreeable to nature; such as farmers, gardeners, hunters, &c. The more man follows nature, and is obedient to her laws, the longer will he live: —the further he deviates from these, the shorter will be his existence. (§ 735.) This is one of the most general of laws. In the same districts therefore, so long as the inhabitants lead a temperate life, as shepherds or hunters, they will attain to old age, but as soon as they become civilized, and by such means sink into luxury, dissipation and corruption, their duration of life will be shortened. It is therefore, not the rich and great,—not those who take gold tinctures and wonder-working medicines, who become old; but country laborers, farmers, &c.—Mortality prevails in the greatest degree where men deviate most from nature,—where her most sacred laws are despised. Rich and nourishing food, and an immoderate use of flesh do not prolong life. Instances of the greatest longevity are to be found among men, who from their youth, lived principally on vegetables, and who perhaps never tasted flesh. Even very sound health may shorten the duration of life: and on the other hand, a certain kind of weakness may be the best means of prolonging it." (§ 670.)

§ 1116. Such are the opinions which one of the most

distinguished medical men in Germany has embraced and published, after the most careful and extensive research on the subject of human life; and I am the more gratified to cite them from such authority, because I had advanced them in my public lectures for three years, before I knew that they had been expressed by Hufeland or any one else. I might proceed to corroborate the physiological principles and general statements which I have advanced, by a very extensive and interesting detail of individual cases of extraordinary longevity.—I might narrate the case of Robert Bowman, who, subsisting wholly on a vegetable and milk diet of the plainest and simplest kind, retained his bodily vigor and mental and moral powers to very great age,—who, when a hundred years old, joined the chase and ran after the hounds: and at the age of a hundred and twelve assisted his family in the harvest field.—Or the case of the French peasant, who, subsisting on coarse, brown bread baked semi-annually, and goats' milk, and breathing the pure air of the mountains on the borders of Switzerland, retained all his faculties and powers to the age of a hundred and fifteen, with uninterrupted health, and remarkable vigor and activity; and at the age of a hundred and twenty was carried to Paris and presented to the king; and there, by a change of diet and other circumstances, rapidly declined for two or three years and died.—Or the case of Thomas Parr, of England, who subsisted almost all his life on bread, milk, old cheese and whey, and who, at the age of a hundred and thirty, was able to perform every kind of work of a laborer,—who when a hundred and forty years old manifested little of the failing of age, and who was removed to London, where an entire change took place in his mode of living, and he soon died at the age of one hundred and fifty-two. Yet, judging from the condition in

which all his viscera were found on examination after death, it was the opinion of Dr. Harvey that he might have lived till he was two hundred years old, had he remained in his native country air, and continued his regular, plain, simple and temperate habits.—Or I might narrate the case of Henry Jenkins, of England, who, subsisting much in the same manner as Parr did, retained his faculties and powers in great vigor, for nearly a century and a half, and with little abatement, carried them up to the age of a hundred and sixty-nine:—or the case of Demetrius Craboski, who was recently living near Polask, on the frontiers of Lithuania, at the age of one hundred and sixty-eight.—“This Russian Methuselah,” says the St. Petersburgh Gazette, “has always led the humble and tranquil life of a shepherd, assisted by his two sons, the eldest of whom, Paul, is one hundred and twenty, and the younger, Anatole, ninety-seven years old.”* But it is more entertaining than useful to devote our time and attention to such details. There are, as I have frequently remarked, (§ 995.) so many modifying circumstances and causes, to be taken into consideration when reasoning from individual experience, that without the best physiological knowledge to guide us in our researches, we are quite as likely to arrive at erroneous as at correct conclusions. (§ 663. 664.)

§ 1117. There are two grand facts however, in rela-

* Indeed, it is very common for native Russians living on a coarse and scanty vegetable diet, even in that severe climate, to exceed a hundred years of life. The late returns of the Greek Church population of the Russian empire, give, in the table of deaths of the male sex, more than one thousand over a hundred years of age. There were forty-nine between a hundred and fifteen and a hundred and twenty;—forty between a hundred and twenty and a hundred and twenty-five;—sixteen between a hundred and twenty-five and a hundred and forty; and four between a hundred and forty and a hundred and fifty.

tion to this matter, worthy of all consideration. The one is that, when individuals who have lived to old age on simple vegetable food, begin in advanced life to partake of animal food, the infirmities of age always increase upon them with a manifestly increased rapidity; and they rarely long survive the change. The other is that, when individuals who have lived to sixty or seventy years of age and upwards on a mixed diet of vegetable and animal food and begun to feel much of the decrepitude of old age and to experience many of its infirmities, if before they are completely broken down and brought upon their deathbeds, they adopt a well-chosen vegetable diet and good general regimen, they always greatly improve in health,—throw off many if not most or all of their infirmities, and retrieve much of the activity and vivacity of earlier life. (§ 1057.) I have witnessed this fact in numerous instances. (§ 1013.)—But I have said enough on this point. No intelligent and unprejudiced individual can faithfully examine this subject, and long remain in doubt that a pure and well-ordered vegetable diet is better adapted, than one containing any portion of flesh-meat, to prolong human life and to preserve the elasticity and activity of the body, and the vivacity and cheerfulness and vigor of the mind. (§ 692.)

Diet with Reference to Prolificness and Endurance of Cold.

§ 1118. There are two other departments of evidence pertaining to the physiological powers common to all organized bodies, which require a brief consideration, because they have been preoccupied by the advocates for the carnivorous character of man, and insisted on as affording irrefragable proof of the constitutional necessity

of at least some portion of flesh-meat in the diet of human beings. The first relates to the perpetuation of the species, and the second to the ability of the human body to endure the intense cold of the frigid zones.

§ 1119. It has been asserted by Buffon and others, and is perhaps generally believed by professional men in flesh-eating countries, that "if man were obliged to abstain totally from flesh, he would not multiply." (§ 811.) To an intelligent and unsophisticated mind, this position must, on a little reflection at least, appear so palpably erroneous, that it hardly seems necessary to attempt a serious refutation of it. Yet, when we consider how powerful is the force of education, preconceived and long-cherished opinion, and deeply established habit, we are less surprised that men of certain kinds of training, should cling to opinions which they have been systematically taught to believe indubitably true; and we see the importance of endeavoring to set men right even in regard to errors which are most obviously preposterous.

§ 1120. It is not necessary that I should enter into any physiological reasonings on this point. If, as I have endeavored to show, a pure and well-chosen vegetable diet is best adapted to sustain the organic economy of the human body in all other respects, (§ 926.) it cannot be possible in the nature of things, that this particular point is a special exception to the general physiological laws of the system. And on this point, we may with more propriety than in regard to almost any other, appeal directly to the general history of the human kind.—We know that in all times, and in all climates, those portions of the human family which subsist mostly or entirely on vegetable food, are vastly more prolific than those portions which subsist mostly or entirely on animal food.—The purely flesh-eating tribes are never prolific. In-

deed, as a general law, the number of births among them in a given time, rarely much exceeds the number of deaths: and hence, such tribes, if they continue to be strictly carnivorous, generally remain for centuries with very little increase in their numbers; and sometimes, even in the most favorable climates, they slowly decrease.

§ 1121. There is probably no purely carnivorous portion of the human family whose climate, quality of food, habits and circumstances generally, are more genial to the physiological interests of the human body and more favorable to the multiplication of the species than those of the Patagonians. (§ 981.) If therefore, flesh-meat were adapted to render the human species prolific, the Patagonians ought to multiply very rapidly. But the reverse of this is signally true. For three hundred years at least, they have inhabited a country whose mild climate and salubrious atmosphere are exceedingly favorable to human life; and yet in all eastern Patagonia south of the Rio Negro—an extent of country which might contain a population of several millions, there are at the present day less than eight hundred inhabitants. If this fact were owing to the mere scarcity of the food on which they subsist, then it would appear either that they have taken precautionary measures to prevent too great an increase of population, or else that, whenever the population exceeds the alimentary supplies of the country, they have swarmed like bees, and sent off the excess of their population to some other part of the country. But neither of these hypotheses is true. They are as prolific as they can be, and yet their number is vastly less than might be sustained by the alimentary resources of the country. Though prone, like all other human beings in similar circumstances, to indulge in the use of tobacco and intoxicating drinks, yet they are so situated, and hitherto,

have had so little commerce with the rest of the world, that they have been able to procure only occasional and very scanty supplies of those articles, and therefore, have probably never suffered to any considerable extent from the use of them. Neither is there any evidence that their population has been often and considerably reduced by frequent and destructive wars, nor by epidemic disease or pestilence. There is therefore, the strongest evidence that the nature of their food is the principal if not the only cause of their being so unprolific: and this conclusion is powerfully corroborated by the general fact already stated, (§ 1120.) that all tribes and nations subsisting wholly on flesh and fish are remarkably unprolific. The inhabitants of Terra del Fuego, we have seen, (§ 980. *f*) have the greatest abundance of animal food and yet their number is very small.

§ 1122. On the other hand, we find the vegetable-eating portions of the human family are so exceedingly prolific that they are constantly under the necessity of devising means and adopting measures to check or to dispose of the excess of population. To say nothing of the vegetable-eating millions of Asia, with whom the very earth and atmosphere seem to teem, we find nearer home a fact so signal and so notorious, that it is greatly marvellous that it has never met the eye and fixed the attention of those philosophers who so strenuously contend for the necessity of a portion of flesh-meat in the diet of man. It is well known to almost every body in Europe and America, that a very large majority of the inhabitants of Ireland, from generation to generation, never partake of flesh-meat enough to have any appreciable physiological effect on the organic economy of their bodies; and yet Ireland, besides being at all times in such a state of overfulness of population, as to be constantly threatened, and

frequently suffering with extensive distress from want of food, and the lives of hundreds of thousands are shortened by starvation, has poured out such a tide of emigration that she has deluged England, Scotland and America, with her naturally hardy and energetic offspring.

§ 1123. On the whole therefore, the true evidence in the case, when correctly apprehended and accurately appreciated, instead of serving in any measure, to prove that the integrity of any function in the organic economy of the human body, requires that flesh-meat should form a portion of the diet of man, goes very powerfully and conclusively to prove that the physiological interests of the human constitution are in every respect, best sustained by a pure vegetable diet. (§ 996.)

• § 1124. In regard to the necessity for flesh-meat to enable the human body to endure severe cold, it is contended that God, in creating man with a constitutional capability of acclimating himself to the wintry regions of the North, has made it essential to his most perfect and successful adaptation to those regions, that he should subsist mostly or entirely on animal food.—To this I reply that, so far as God has constituted and ordained things in such a manner as that, animal substances are all or nearly all that the frigid zones afford for human aliment, and in such a manner as that, the human body is far less injuriously affected by the free use of flesh-meat in cold regions than in the torrid or even in the temperate zones, so far it may with propriety be said that God has made it necessary for the inhabitants of the frigid zones to subsist on animal food. But the notion that the physiological powers and functions of the human body, are better sustained by flesh-meat than they *can* be by a well-chosen vegetable diet in the wintry regions of the poles, is entirely false. Could proper vegetable food be had in

abundance in the frigid zones, it would be better aliment for man in every respect, than flesh-meat, even in the coldest spot where human life can be preserved. That is, provided man is accustomed to such a diet in those regions from his childhood up, or fully habituated to it before he enters those regions. Or in other words,—all other things being precisely equal, the man who is fully accustomed to a pure vegetable diet, can endure severer cold, or bear the same degree of cold much longer than the man who is fully accustomed to a flesh diet.

§ 1125. Were animal heat a mere chemical effect, or were it produced in the same manner as we produce a sudden, sensible glow throughout the system by drinking alcoholic liquor, it might not be easy to perceive how the same diet which best enables us to endure the intense heat of the torrid zone, should also best enable us to endure the intense cold of the frigid zone. But let it be remembered that animal heat is purely the effect of vital function, (§ 499.) and that the power of the body to regulate its temperature according to the surrounding medium, so as to sustain the extremes of heat or cold, is always greatest when its physiological properties and powers are in their most healthy and vigorous state and condition. And this, we have seen, (§ 996.) is most perfectly secured by a pure and well-chosen vegetable diet.

§ 1126. Reasoning from false notions derived from mere momentary sensation, mankind long clung to the opinion that alcoholic liquor would enable them better to endure both heat and cold: and although modern experiments are beginning to set them right concerning alcohol, yet they blindly cherish the idea that flesh-meat is better for them in cold regions, than vegetable food; without pausing to consider that while it actually affords them less real and permanent nourishment, (§ 916.) it stimulates

them more, and exhausts the vital powers of their organs more rapidly, and therefore, in all that it differs in its effects from vegetable food, it approaches more nearly to the character of alcohol.

§ 1127. We know that in some of the coldest portions of the Russian Empire, the people subsist on coarse, vegetable food, and are exceedingly hardy and vigorous. I have been assured by highly intelligent gentlemen who have spent many months in Siberia, that no exiles to that wintry region, endure the severities of the climate better than those who have been all their lives, accustomed to a simple vegetable diet. And it has proved universally true, except in cases of far-gone and incurable disease—that, all those who have adopted a strict vegetable diet and correct general regimen, in this country, within six or seven years past, have experienced a decided increase of physiological power to endure severe cold, and have found themselves able to preserve the temperature of their bodies more uniform and agreeable with less clothing by day and by night.

§ 1128. It is unquestionably true however, as testified by those who have attempted to explore the polar regions, that when British sailors and others who have been accustomed to live mostly on salted animal food, are taken into those regions, they are enabled to endure the intense cold better by subsisting on the fresh animal food of the natives. Nevertheless, it is entirely certain that both they and the natives would endure the cold still better if they were well trained to a correct vegetable diet.

LECTURE XVIII.

Comparative effects of vegetable and animal food on the sensorial power of the nervous system—particularly, on the special senses and the intellectual and moral faculties—Relations between the nervous and sensorial powers—Excessive expenditure of one diminishes the other—Great intellectual and great animal powers rarely combined—All over-working, or over-excitement of the stomach impairs the sensorial power—Excessive alimentation diminishes the sensorial power—Narcotic stimulants still more detrimental—Flesh-meat impairs the sensorial power—Vegetable food most favorable to the sensorial power, and the acuteness of all the senses—Objections in regard to the lower animals, made and answered—The case of Caspar Hauser—His wonderful power of vision, hearing, smell, taste, and touch, and the discriminating sensibility of his stomach—Effect of flesh-meat on his special senses—Other cases adduced—Effect of flesh-meat on the intellectual powers—Opinions of ancient philosophers—Stupidity and indocility of all flesh-eating tribes—Irish children, and the Irish in general—Caspar Hauser—the wonderful activity and power of his intellectual faculties—These diminished by flesh-meat—The children of the Orphan Asylum of Albany, New York—The Greek children of Syra—The young slaves in the West Indies—The Zulu's of Africa—The Hindoos—Great men that live on a mixed diet—True intellectual power—Difference between mind and soul—Capabilities of flesh-eaters—Wild boy of Mississippi—Vegetable diet and insanity—Principles explained and illustrated and facts adduced.

§ 1129. THE physiological evidence in relation to the natural dietetic character of man, that next demands our attention, is that which is afforded by the comparative effects of animal and vegetable food on the sensorial power of the nervous system;—and particularly on the

functional powers of the organs of special sense (§ 396.—409.) and those more immediately concerned in the intellectual and moral manifestations. (§ 260.)

§ 1130. We have seen (§ 164.) that, the nervous system of the human body, possesses the wonderful vital endowments of nervous and sensorial power. The nervous power is wholly employed in those important vital operations, which are concerned in the growth and sustenance of the body, (§ 164.) and which we have already contemplated. The sensorial power is employed in the functions of animal sensation, perception, reflection, volition, voluntary motion, &c. (§ 165.) These two properties of the nervous system, though very different from each other, are yet so intimately related, that they both equally depend on the most healthy and perfect state of the nervous system, for their highest and best condition; so that, whatever in any measure deteriorates the nervous structure, or impairs its vital properties, always necessarily diminishes the healthy nervous and sensorial power of the system. And it is an inviolable law, that, all excessive exercise, or expenditure of the one, always diminishes the functional energy of the other: all excessive exercise of the passions and of the mind, always necessarily diminish the functional power of the stomach and all other organs concerned in the growth and sustenance of the body, and which depend on the nervous power of the system: and on the other hand, every thing that increases the demand for the concentration of nervous power in the stomach and other organs, for the performance of their functions, and increases the exhaustion of that power, in the performance of those functions, beyond what is indispensably necessary for the healthy operations and results of the vital economy, always necessarily diminishes the sensorial

power of the system and the functional energy and integrity of all the organs depending on that power. Hence the notorious facts, that they who greatly cultivate the intellectual powers and follow intellectual pursuits—and more especially if those pursuits are of an exciting kind, always find it necessary to give much care to the preservation of the functional power and integrity of the organs concerned in the general office of nutrition: and for the most part—though mainly from errors of regimen, such individuals are delicate in their health and feeble in their muscular ability: while on the other hand, those who greatly cultivate their bodily powers, and maintain a high state of health and possess great muscular strength, very rarely if ever, manifest much compass and energy and activity of mind.

§ 1131. With these facts the ancients were perfectly well acquainted, though they knew nothing of the physiological principles, by which they are accounted for. The statues and all other representations of Hercules and of the ancient athletæ, which have come down to us, exhibit great muscular development, and indicate small intellectual powers.

§ 1132. All over-working, over-excitement, and irritation of the stomach and other organs concerned in the general function of nutrition, necessarily cause an abatement of the sensorial power of the nervous system. And by over-working, I do not mean merely that oppression of the stomach and other organs, which is attended with immediate distress or uneasiness: but I mean all that exceeds the real wants of the vital economy and is attended with a greater expenditure of vital power, than is indispensably necessary to the healthy and perfect operations and results of the economy.—Before the constitution has been broken down, while its springs are yet elastic

and its energies are great, the most vigorous and high-toned health of body, may be maintained for a considerable time, at a most prodigal expense of vitality, without any of those painful feelings which tell us that we are excessively over-working the system, and warn us that we are pushing our health to the extremes which approach to the very verge of violent disease and sudden death.

§ 1133. However pure and well-adapted our food, and correct our regimen in other respects therefore, if we are habitually excessive in quantity only, we necessarily oppress our organs, and diminish the sensorial power of the nervous system, and commensurately render our intellectual and moral and voluntary faculties sluggish and inactive and feeble. But when our excesses include over-stimulation, and the use of irritating and deleterious substances we greatly increase the injuries of the system, and the reduction of the sensorial power.

§ 1134. It is true however, that diffusive stimulation, produced by even the most pernicious substances introduced into the nose or mouth or stomach or other organs—if the system is accustomed to them—will, while it lasts, by increasing the general excitement of the nervous system, increase the activity of the mental faculties, and especially in persons in whom the sensorial power has been impaired by previous debauches of the kind, or by excesses of any other sort. Yet such stimulations always necessarily, in the end, leave the nervous system more depressed and impaired, and the sensorial power more diminished, than they found them: and therefore, the physiological principles which I have laid down on this point, are always, and without exception, true.

§ 1035. Flesh, I have repeatedly stated, (§ 916. *et seq.*) is much more stimulating in proportion to the nourishment which it affords the system than proper vegetable

food; and hence, while it passes through the stomach in a shorter time,—and therefore has been supposed to be more easily digested, (§ 920.) yet it actually causes a greater concentration of nervous energy and a greater expenditure of vital power in that organ during the process of digestion, and consequently, causes a greater abatement of the sensorial power of the nervous system, and leaves the assimilating organs more exhausted from the performance of their functions, than vegetable aliment. (§ 921.) And moreover, the nervous structure itself, organized from blood formed of flesh-meat, is less perfectly adapted to high sensorial power and activity than that resulting from pure vegetable aliment.

Diet with Reference to the Special Senses.

§ 1136. In every respect therefore, a correct vegetable diet is more conducive to a high and healthy state of sensorial power in the nervous system of the human body, than flesh-meat; and consequently, the functional powers of all the organs of special sense,—or of touch, taste, smell, hearing, and sight, and of the intellectual and moral faculties, are rendered more perfect, vigorous, and active, by a correct vegetable diet than by animal food; or by a mixed diet of vegetable and animal food.

§ 1137. And this is not only evident from physiological principles; but it is fully proved; first, by those who had for many years wholly abstained from flesh-meat and afterwards commenced the use of it: and second, by those who had long been accustomed to the use of flesh-meat, and afterwards totally abstained from it. And first: let us consider the facts in relation to the special senses.

§ 1138. But I anticipate the objection that predatory animals, which subsist entirely on flesh, possess the most

powerful and discriminating special senses. This assertion I admit to be partly correct and partly erroneous; and still contend nevertheless, that even its truth does not militate in the least, against the principle which I have advanced. In regard to the special senses, it should be understood that there is a nice distinction between simple *power* and *discrimination*. A hound for instance, may have the olfactory power of scenting its game much farther than a sheep can smell its food, while at the same time the olfactory sense of the sheep may be much more nicely discriminating than that of the hound. The first of these properties depends on anatomical arrangement, the second is purely physiological, and depends entirely on the sensorial power. Hence, in all those predaceous animals which have the power of scenting their game or food at a considerable distance, the olfactory nerves are proportionably larger than in other animals, and are ramified over more extensive nasal surfaces: while in those herbivorous and other animals which simply require an olfactory sense to discriminate the qualities of substances near at hand, the olfactory nerves are proportionably smaller, and the olfactory apparatus more simple in its mechanical construction; and it is worthy of remark that in this respect the organization of man decidedly places him with vegetable-eating animals.

§ 1139. We see therefore, that the fact that predaceous animals, with a much more extensive and complicated olfactory apparatus, have a greater power of smell than herbivorous animals, does not in the least degree go to prove that flesh-eating is favorable to the sensorial power of the special senses. For it may nevertheless be true that the olfactory sense of herbivorous animals, discriminates the delicate qualities of things near at hand, and especially those which relate to the alimentary and respiratory

wants of their bodies, much more nicely than that of predaceous animals. And in fact, we know it to be true that the sensorial power of the organ of smell, even of carnivorous animals themselves, is greatly exalted by abstinence from flesh-meat. I have the authority of some of the most experienced sportsmen in England, for saying that—“ always in preparing hounds for the chase they are carefully trained.—For at least a fortnight before they are put upon the chase, all animal food is taken from them, and they are kept strictly upon coarse, dry bread with a little water; because flesh-eating has a powerful effect to deaden the nice sensibility and discriminating power of the olfactory nerves, and to make the hounds heavy and sluggish. If they are permitted to eat flesh freely till they enter upon the chase, the sense of smell is so blunted that they will not open on the track, and get the fox up. They are not suffered therefore to touch a morsel of animal food for two weeks before they are put on the chase.”

§ 1140. If man were to live like beasts of prey, on simple, uncooked flesh and water, and breathe only the pure air of the forest, the discriminating power of his special senses, would undoubtedly be much greater than he possesses in civic life, living on a mixed diet, or even on vegetable food, with the ten thousand depraving and deteriorating influences of the artificial circumstances and pernicious habits of society, continually acting upon him, and impairing all the physiological properties of his system. But the simple question before us is,—would man, either living in all the natural simplicity of the lower animals, in the open and pure air of the fields and forests; or cribbed up in cities and surrounded by all the artificial circumstances and depraving influences of civic life, possess an equal power and discriminating keenness of the special

senses, whether he lived on animal food, or a mixed diet of animal and vegetable food, or on pure vegetable food —being in all other respects, in either case, equally temperate and correct?—To this question, I confidently answer no!—and affirm that both physiological science and facts clearly and conclusively prove that a pure and well-ordered vegetable diet is more conducive to the functional power and integrity of the organs of special sense than animal food, or than a diet which includes any portion of flesh-meat. The physiological principles I have already sufficiently explained; (\S 1129 *et seq.*) and we have seen that even in the hound, which is naturally a carnivorous animal, the sensorial power of the organ of smell is much exalted by an entire abstinence from flesh-meat. (\S 1139.)

1141. The story of Caspar Hauser is probably known to every body.* He was, as we are informed, for some

* Since the death of this extraordinary youth, it has been attempted, even by the noble gentleman who adopted him, to prove that Caspar was an impostor, and his whole story a falsehood. But I am bold to declare that neither Caspar Hauser nor any other human being could fabricate such a story. The intrinsic evidences of its genuineness are irrefragable, and such as could not have been forged. There are many physiological principles developed in his case which have since been repeatedly demonstrated in other cases, but which could not have been known to him, and which were evidently not understood by the gentleman who wrote his history, nor by any other one connected with him. (\S 1150.) It is very possible and even probable, that Caspar learned to dissimulate and practise falsehood, and that the unbounded attention which he received, begat in him an insatiable desire to be the object of continued and increased attention. Indeed, he must have been something more than human, if he was not thus vitiated by the circumstances in which he was placed and the treatment he received after he became the object of public attention and excitement. Whether he was the child of a nobleman or a peasant, I neither know nor care, nor shall I insist that he was actually confined in a dark dungeon just seventeen years. But that he had long been secluded from the light and

cause or other, confined in a narrow, dark dungeon from early childhood till he was about seventeen years old, when he was released, and on the 26th of May, 1828, was found at one of the gates of the city of Nuremberg, in Bavaria, Germany, and was soon taken under the care of the city authorities. During the whole time of his confinement he was kept in a sitting posture with no other clothing than a shirt, and made to subsist on coarse, brown bread and water exclusively. Considering the position in which he was kept during the greatest part of the period of his growth, his total want of exercise, the confined air which he breathed, and the entire absence of light, his body was developed with remarkable symmetry and beauty.— When he first came out of his dark dungeon, and for considerable time afterwards, the acuteness and power of his sight, hearing, smell, taste and touch, far exceeded any thing of the kind ever before known in a human being.

§ 1142. Being accustomed during his whole confinement, to what is ordinarily called total darkness, his eyes acquired the power of perceiving things by the aid of so extremely small a quantity of light, that he was able to see distinctly, where ordinary human eyes could see nothing. "It has been proved, by experiments carefully made," says his learned biographer,— "that in a perfectly dark night, he could distinguish different dark colors, such as blue and green from each other. He could walk anywhere as well in the dark as in the light, and was astonished to see others groping and stumbling along in the from the ordinary influences of society, and subsisted on an extremely simple vegetable and water diet, and that the statements made by his biographer of the physiological and psychological phenomena attending his first appearance in Nurenburg and during the change of his habits, are true, cannot be doubted by any one who is thoroughly acquainted with the science of human physiology.

dark. When, at the commencement of twilight, a common eye could not yet distinguish more than three or four stars in the sky, he could already discern the different groups of stars, and could distinguish the different single stars of which they were composed, from each other, according to their magnitude and the peculiarities of their colored light."

§ 1143. But all this will perhaps be said to be wholly the effect of his having been long accustomed to darkness, and had nothing to do with his diet.—We shall see however, in the sequel, that this conclusion is erroneous. His being long confined to what we call total darkness, certainly caused his eyes to acquire the power of seeing by the aid of an exceedingly small quantity of light; and also unfitted them to bear full daylight with comfort;—and consequently, when he first left his dark prison, the full light of day was distressing to him, and rather served to dazzle and blind him than to increase the distinctness of his vision:—hence, for some time after he was set at liberty, he could see more distinctly and much farther after sunset, than at noonday. Now if all this had been exclusively the effect of his having been so long confined in darkness, then as his eyes became more and more accustomed to the full light of day, his extraordinary power of vision would gradually have diminished, till it became nothing more than ordinary. But this was not the case. As he became more and more accustomed to the full light of day, his distinctness and power of vision in the night gradually decreased, and at the same time commensurately increased in the day, till he became as remarkable for his visual power by day as he had been by night, and could distinctly see small objects far beyond the reach of ordinary vision:—and "his sight," says his learned biographer, "was as sharp in distinguishing ob-

jects near, as it was penetrating in discerning them at a distance.—In dissecting plants, he noticed subtle distinctions and delicate particles which had entirely escaped the observation of others.”

§ 1144. Moreover, if long confinement in darkness had been the sole, or even the principal cause of the astonishing visual powers of Caspar Hauser, it certainly could not account for the fact that he was equally remarkable for the discriminating acuteness and power of his other special senses.

§ 1145. “His hearing,” says his biographer, “was scarcely less acute than his sight. When walking in the fields, he once heard, at a distance comparatively great, the footsteps of several persons, and he could distinguish these persons from each other by their walk.”

§ 1146. His acute sense of smell was most troublesome and painful to him—exposed as he constantly was, to those concentrated and offensive odors, that almost everywhere abound in that artificial state of things peculiar to civic life: while it fitted him the more perfectly for that pure and uncontaminated state of nature, in which the special senses are the true sentinels of organic life; (§ 700.) and with the most perfect discrimination and integrity, act determinately for the security of the vital interests of the body. By so much the more therefore, as he was fitted for such a simple and natural state, he was in a condition to be offended and distressed by an artificial and unnatural state of things. The odors of the rose and other fragrant flowers and shrubs, which, in a state of nature, thinly scattered over the earth, and breathing their sweetness to the pure and diluting air, would have been exquisitely delightful to his keenly discriminating sense, when greatly concentrated and densely freighting the atmosphere from the flower-gardens o

artificial cultivation, were extremely oppressive and even painful to him. (§ 702.) "He was able to scent things at a very great distance. He could distinguish apple, pear, and plum trees from each other, at a considerable distance by the smell of their leaves. Different coloring materials, pencils, &c. imparted a painful odor to his keen sense. He smelled tobacco when in the blossom in the fields, at the distance of fifty paces;—and at more than one hundred paces, when it was hung up in bundles to dry, causing him headaches, cold sweat and fever. The smell of old cheese, made him feel unwell and vomit. The smell of strong vinegar, though full a yard from him, operated so powerfully upon his nose and eyes as to bring tears into his eyes. When a glass of wine was filled at table, at considerable distance from him, he complained of its disagreeable smell, and of a sensation of heat in his head. The opening of a bottle of champagne, was sure to drive him from the table or to make him sick. The odor of flesh, was to him, the most horrible of all smells. When walking by a grave-yard, the smell of the dead bodies, of which others had not the slightest perception, affected him so powerfully as almost immediately to bring on an ague and cause him to shudder. The ague was soon succeeded by a feverish heat, which at length resulted in a violent perspiration, by which his linen was thoroughly wet. He afterwards said he never experienced so great a heat, and complained, on his return to the city gate, that his sight had been affected thereby. Similar effects were once after experienced by him, when he had been, for a considerable time, walking by the side of a tobacco field."

§ 1147. His sense of taste and sense of touch, were equally acute and astonishing. Indeed the power of all his senses seemed miraculous. He would instantly

detect the nicest qualities, and the slightest difference in qualities of things of taste and of touch: and he could not be deceived in these respects, by any devices or means. Nothing was more loathsome to his taste, than flesh. Even enveloped in bread, it caused great disgust and distress, as soon as he took it into his mouth. With equal discrimination and power would he detect the nicest difference in the tangible properties of things.

§ 1148. “One of the most difficult undertakings, was to accustom him to the use of ordinary food:—and this could be accomplished only by slow degrees,—much trouble and great caution.—The different preparations of farinaceous food, most readily agreed with him and became agreeable. At length, he was gradually accustomed to eat flesh, by mixing at first only a few drops of gravy with his gruel, and a few threads of the muscular fibre of the flesh with his bread, after the juices had been boiled out,—and by gradually increasing the quantity.”

§ 1149. But it will be said that it is far from being desirable to possess such an exquisite keenness and discriminating power of the senses: (§ 703.) for it would only serve to unfit one for society—for usefulness, and for all the enjoyments of civilized life, and render human existence a curse rather than a blessing. So, if I were accurately to describe the pain which every sin, and the slightest departure from spiritual truth and righteousness, would cause a perfectly holy human being, were such a one on earth, most of mankind, even in Christian lands, would make the same objection to such a state of the soul, and on precisely the same grounds:—and the analogy between the two cases is perfect.

§ 1150. But it should be remembered, that whatever may be our power to reconcile our special senses to the deleterious and the offensive properties of things, we have

no power to reconcile those properties to the vital interests of our bodies: (§ 735.) and therefore, though we may succeed in so far depraving the sentinels of life, (§ 700.) and so completely destroying their natural instinctive integrity, as even to cause them to delight in the poisonous properties of tobacco and other pernicious substances, (§ 707.) yet those properties always remain equally unfriendly to the physiological interests of our bodies,—always necessarily retain their *antivital* character. It would therefore, be quite as rational and as wise for a traveller, who, finding his journey lay continually among pit-falls and precipices, and feeling himself constantly alarmed and tormented by the perception of the dangers that surrounded him, should put out his eyes, and in his blindness, congratulate himself on his deliverance from all his perils and annoyances, as it is for human beings to desire to escape from the perception of the dangers that surround them, in the deleterious properties of things, by an entire depravity of their senses of smell and taste.—The truth is that, the case of Caspar Hauser affords many of the most important physiological facts and demonstrations, that have ever been presented to the scientific world: and happy will it be for mankind if they will learn wisdom from such extraordinary instruction.

§ 1151. But how, it is inquired, can we arrive at any definite and determinate physiological conclusions from the evidences of this remarkable case, when we find his special senses taking offence indiscriminately, at noxious and innoxious substances?

§ 1152. This is not a true statement of the case; and only evinces the very superficial observation and limited attention which have been given to the subject.—The real fact is, his sense of smell and of taste discriminated with exquisite delicacy and infallibility between salutary and

deleterious substances. It was only when the odors of innoxious substances were in great excess, and therefore unfriendly to the physiological interests of his body, that his olfactory sense was oppressed, and pain induced by them:—while the odors of noxious substances, were always, in all quantities—even the smallest,—offensive and distressing to him; producing all those physiological phenomena or symptoms, which indicate the instinctive efforts of the system to repel or reject morbidic causes. (§ 300.)

§ 1153. The odors of roses and other innoxious flowers and shrubs, when properly diluted by the pure atmosphere, so as to be compatible with the physiological interests of his system, were exquisitely delightful to him; but when the air was too deeply freighted with the dense fragrance of flower-gardens, &c. his olfactory sense, true to the vital welfare of the body, became oppressed by the concentrated sweets, rendered pernicious by excess. (§ 702.) The odors of tobacco and of the dead bodies of the grave-yard and other pernicious substances, on the other hand, even when most slightly perceived, were loathsome and distressing to him, (§ 1146.) and when strongly perceived, his system powerfully manifested those symptoms which indicate the presence of substances directly and irreconcileably hostile to the vital interest of the body. And it is a matter of great importance to physiologists, to observe the natural, instinctive economy of the human body in such a state, by which it first indicates the invasion of the vital domain by noxious agents, and then, by which it expels those agents from that domain. And also to observe the intimate relation, and powerful sympathy existing between the different special senses.—The loathsome odor of the dead bodies, greatly affected his sight. (§ 1146.)

§ 1154. And surely, the civilized world should learn

a deep lesson of wisdom from the physiological facts before us,—so far at least, as regards the location of grave-yards. For although we, in the depravity of our senses, perceive not the baneful odor of the decaying dead; yet the facts that Caspar Hauser could perceive it so strongly, and experienced such violent effects from it, are physiological demonstrations for the whole human species;—and show with what propriety the Mosaic dispensation guards with most rigorous caution, against all contact of the living with dead bodies.

§ 1155. The same reasoning holds good, in regard to the physiological demonstrations of the sense of taste in Caspar Hauser, that I have presented concerning his smell. All simple farinaceous preparations and proper fruits, very readily became agreeable to him; while flesh-meat, in whatever way prepared, caused the deepest loathing and abhorrence,—both as perceived by the sense of smell and of taste: and the physiological perception of the stomach, (§ 737.) with equal promptitude and power, and with equal delicacy and accuracy of discrimination, detected in it, those properties which are not adapted to the purest condition and highest interests of the body.

§ 1156. The want of physiological knowledge in those who had the care of Caspar Hauser, led them to many erroneous practices, and no little confusion of statements, concerning him; still however, an accurate physiologist, is able to reduce the facts in the case, to their true order; and to derive from the extraordinary experiment, the most complete physiological demonstrations. As in the case of the olfactory sense, so with that of taste, many substances naturally innocent and perhaps in a measure salutary, were, by artificial concentration, and other insalutary preparations, rendered oppressive and offensive to him: (§ 710.)—and substances which were naturally

more stimulating than those to which he had been accustomed, at first produced somewhat unpleasant effects on his organs. But, in regard to the smell and taste of flesh, there was a deep instinctive loathing and abhorrence, which, as we have seen, (§ 1148.) could only be overcome by the smallest degrees and in the slowest and most cautious manner. “When the first morsel of flesh was offered to him, scarcely had it touched his lips, before he shuddered—the muscles of his face were seized with convulsive spasms, and with visible horror he spit it out.” “Some flesh was subsequently concealed in his bread:—he smelt it immediately, and expressed a great aversion to it: but was nevertheless prevailed upon to eat it: and he felt afterwards extremely ill in consequence of having done so.”* “Even milk, whether boiled or fresh, possessed so much of the animal odor and flavor, and was so much more exciting than his bread and water, to his stomach and alimentary tube, as to be unpleasant to him. Beer, wine, brandy, tobacco, coffee, and all other alcoholic and narcotic substances, were most powerfully offensive to his senses of smell and taste, and distressing to his body: producing even more violent effects on his system than flesh.

§ 1157. Now then, in regard to the effects of flesh-eating on the special senses,—we learn from the case before us, in the first place, that the very extraordinary power and acuteness of the special senses of Caspar Hauser, were not caused by his long confinement in darkness and silence, because they remained equally extraordinary when he had become fully accustomed to the light of noonday and the noise of civic life:—neither were

* The same effects are invariably produced when flesh-meat is first given to children which have been accustomed only to a pure vegetable diet under a correct general regimen. See § 880.

they owing principally, to the entire absence, during his long confinement, of those properties of external things which, acting immediately upon the organs of special sense, deprave and impair their peculiar powers. It is very certain however, that after his release from his dungeon, and his entrance into the city of Nuremberg, the constant action of offensive olfactory and gustatory properties, on his organs of smell and taste, had considerable effect, to deprave and impair the peculiar powers of those organs; yet, notwithstanding all this, the acuteness and intensity of the perceptive power of his special senses, remained almost supernatural, while he continued to subsist on his simple diet of bread or plain farinaceous food and water: but precisely with equal step, as he became gradually more and more accustomed to the use of flesh-meat, (§ 1148.) the extraordinary acuteness and power of his special senses diminished.

§ 1158. "After he commenced eating flesh," says his biographer, "he had an opportunity of comparing the acuteness of his hearing with the still greater acuteness of the hearing of a blind man, who could distinguish even the most gentle step of a man walking barefoot. On this occasion, Caspar observed that his hearing had formerly been much more acute; but that its acuteness had been considerably diminished since he had begun to eat flesh, so that he could no longer distinguish sounds with so great a nicety as that blind man."

§ 1159. But it will be asked;—how came the blind man by such an extraordinary acuteness of hearing?—Did he too live on bread and water?—There are many nice physiological and psychological principles involved in this fact, the full explanation of which, would require an extensive treatise. Suffice it to say however, that the organs of sight and hearing are in a more eminent degree than

those of the other special senses, the instruments of the mind, and are not liable to be depraved like those of smell and taste, by the direct action of deteriorating substances, (§ 401.)—that all the special senses are capable of a high degree of cultivation,—and that it is wisely and benevolently so ordered that the destruction of the sight, may be, to a very considerable extent, compensated, by an extraordinary increase of the power and acuteness of hearing, by means of careful and long-continued cultivation, or attention to the nicest auditory impressions. And thus the blind man is enabled to *hear* his way along the public streets, and to avoid running against surrounding objects, with almost as much accuracy as those who see.

§ 1160. That we may fully understand and appreciate the truth in the statement before us, concerning Caspar and the blind man, therefore, it is important to observe, that whatever may have been the diet of the blind man, which was undoubtedly very simple, his auditory power to perceive the slightest vibrations of the atmosphere, and to discriminate between the nicest differences, in the auditory qualities of those vibrations, had been cultivated, probably, to the very top of his capabilities: while Caspar's extraordinary acuteness and power of hearing were in no degree the effect of cultivation, but depended entirely on the pure, natural sensibilities of his organs: or on the very great degree of natural and healthy sensorial power of his nervous system: and hence, while the blind man exhibited only a highly cultivated power of hearing, which is not uncommon with blind men, Caspar manifested a most extraordinary natural power of all the special senses, and which, at the time of this trial, as he himself justly remarked, had already been very considerably diminished by his eating flesh.

§ 1161. As he became more and more confirmed and

free in his habit of flesh-eating, the extraordinary acuteness and energy of his special senses continued to diminish, till in a short time, they wholly disappeared and he retained nothing but the most ordinary powers. And, as if Divine Providence had, by special design, raised up this youth for the most specific and important physiological and psychological purposes, it is remarkable that he perseveringly refused to defile himself with wine, beer, tea, coffee and all other alcoholic and narcotic substances; and rigidly abstained from the use of spices and heating substances, and thus in the most signal and unquestionable manner, demonstrating that flesh-meat was the principal cause of the very great abatement of the acuteness and energy of his special senses.

§ 1162. The same general facts, as those exhibited in the case of Caspar Hauser, though not of so remarkable a character, have been observed in numerous other instances, where individuals had for many years been accustomed only to a plain, simple, and wholesome vegetable diet, and afterwards become habituated to the use of flesh.

§ 1163. On the other hand, it has been a matter of very frequent and extensive observation, that those, who having been always accustomed to the use of flesh-meat, abandon it entirely, and subsist on a plain and simple vegetable diet, experience a very great improvement in their special senses. I have seen many such instances within the last six or seven years; and some of them, of a very marked character. This improvement however, is generally perceived much sooner in the smell and taste than in the sight and hearing; and in some cases, the sudden substitution of a less, for a more stimulating diet, will cause a temporary depression of the physiological powers and functions of the system, and especially those apper-

taining to organic life; (§ 893.) and while this depression or species of indirect debility, continues, the special senses, and particularly sight and hearing are often, to a considerable extent, involved in the general effect, and their functional powers are commensurately diminished; in consequence however, of a relaxation of the anatomical mechanism of the organs, rather than an abatement of sensorial power: but as soon as the vital properties of the body become perfectly adapted to the character of the new diet, the general tone of the system is elevated, and the functional powers of the special senses greatly improved;—provided always, that the vegetable diet is of a proper kind and condition, and the individual is not intemperate in quantity, nor improper in his regimen and habits in any other respect:—for every species of excess is necessarily injurious to the special senses, and none more so than gluttony and licentiousness.

§ 1164. Dr. Lambe, of England, of whom I have frequently spoken, (§ 1104.) and who has probably been the most extensive and accurate observer on this subject of any man in Europe, confidently affirms, that, “not only are the special senses improved by the disuse of flesh, but this improvement,” says he, “pervades every organ and influences every function of every part of the system. Observation shows,” continues he, “that there is no organ of the body, which under the use of vegetable food, does not receive a healthy increase of its peculiar sensibility,—or that power which is imparted to it [by the nervous system.]”

Diet with Reference to the Intellectual Powers.

§ 1165. I have now, so fully shown that flesh-eating diminishes the sensorial power of the nervous system,

and consequently the functional powers of the organs of special sense; and have so extensively explained the physiological principles pertaining to the subject (§ 1130. *et seq.*) that, it is not necessary for me to enter any farther into physiological explanations, before I proceed to the statement of facts in relation to the comparative effects of vegetable and animal food on THE INTELLECTUAL POWERS AND MANIFESTATIONS.

§ 1166. That flesh-meat is less friendly to intellectual vigor and activity than vegetable food, is by no means an opinion peculiar to modern times. Theophrastus, who studied under Plato and Aristotle, and succeeded the latter in the Lyceum,—the number of whose auditors, we are informed, became two thousand, and who died at the age of a hundred and seven,—two hundred and eighty-eight years before Christ, says that, “eating much, and feeding upon flesh, makes the mind more dull, and drives it to the very extremes of madness.” “It was,” says Dr. Lambe, “proverbial among the ancients that the athletæ were the most stupid of men; and Diogenes the Cynic asserted that it was wholly owing to their excessive use of the flesh of swine and oxen.”

§ 1167. The Calmucks, and indeed, all other portions of the human family that subsist principally upon flesh, are remarkable for their mental stupidity, sluggishness and indocility.

§ 1168. Sir John Sinclair, in his Code of Health,—a work replete with research and historical knowledge, says that, “vegetable food has a happy influence on the powers of the mind, and tends to preserve delicacy of feeling and liveliness of imagination, and an acuteness of judgment, seldom enjoyed by those who make a free use of animal food. The celebrated Franklin ascertained, that a vegetable diet—promoting clearness of ideas, and

quickness of perception, is to be preferred by those who labor with the mind."—"In proof of the assertion," continues Sir John, "that a vegetable diet promotes clearness of ideas and quickness of thought, and that a transition from vegetable to animal food, produces injurious effects,—a friend of mine states that, he has more than once selected from his tenants' children in Ireland, a boy remarkable for that smartness of intelligence, so common in the Irish youth, while in the capacity of errand boys on the farm, or helpers in the stables, and before they became pampered with better food than their parents' cabin afforded. The lads, at first, were lively and intelligent, and displayed a degree of shrewdness, exceeding what is generally met with from the youth of a more elevated walk in England.—But he invariably found that, in proportion as those boys became accustomed to animal food, and (according to common notions) were better fed, they relaxed in activity and became dull and stupid; (§ 1004.) and he is confident that the change in the disposition, was the effect of the change of diet, and was not owing to corruption of mind, from intercourse with the other servants. In fact, they lost all their vivacity of manner, so inherent in the Irish boys, whether born in the vast bog of Allen, or in the dry and rocky counties of Mayo and Galway. He is therefore inclined to think that the character of the people, does not depend so much upon climate and soil as upon food; for no part of the globe can differ more than those parts of that kingdom."

§ 1169. These facts in relation to the Irish youth, are of very great importance and deserve far more attention from philosophers and philanthropists, than has ever been given to them. The Irish peasantry, wherever they are known in the civilized world, are proverbial for

their peculiar expressions, commonly called *Irish bulls*, and which are generally considered as attributable to their peculiar national stupidity; or natural *crookedness* of mind, if I may so express myself. Whereas, directly the opposite of this is true. There is probably no class of people on earth, more remarkable for natural quickness and shrewdness of mind, than the Irish peasantry of pure and simple habits: but they are, as a general fact, entirely destitute of the advantages of education, and therefore, have a very limited and imperfect use and knowledge of language. The consequence is that their intellectual quickness and activity, with their ignorance of the grammatical force and arrangement of words, continually leads them to express their ideas in a very peculiar—generally shrewd—often ludicrous—but always spirited and witty manner. Their very blunders therefore, are really, evidences of their remarkable natural quickness and activity of mind:—and hence, when well educated, they are often found among the most eloquent and witty men and able writers in the world.

§ 1170. The case of Caspar Hauser in relation to this point, is, of itself alone, a complete and unequivocal demonstration of the principle I am contending for.—I have already briefly stated many important facts in his history, (§ 1141. *et seq.*) and have spoken of his deep aversion to flesh, tobacco, wine, beer, brandy, tea, coffee and many other things, and of the very great difficulty and caution with which he was slowly accustomed to animal food. (§ 1148.)

§ 1171. While he continued to subsist entirely on his simple diet of bread and water, as he had done in his dungeon,—“the activity of his mind,” says his learned biographer,—“his fervent zeal to lay hold of every thing that was new to him,—his vivid,—his youthfully power-

ful and faithfully retentive memory, were such as to astonish all who witnessed them." "The curiosity—the thirst for knowledge, and the inflexible perseverance, with which he fixed his attention on any thing which he was determined to learn or comprehend, surpassed every thing that can be conceived of them."

§ 1172. About two months after he entered the city of Nuremburg, he was taken to the house of Professor Daumer, with whom he afterwards resided, and from whom he received regular and systematic instruction: and where he was also carefully and regularly educated to the use of animal food in the manner I have described. (§ 1148.)—"In Professor Daumer's notes respecting Caspar," says his biographer, "he has made the following observations. 'After he had learned regularly to eat flesh, his mental activity was diminished;—his eyes lost their brilliancy and expression;—his vivid propensity to constant activity was diminished, and the intense application of his mind gave way to absence and indifference; and the quickness of his apprehension was also considerably diminished.' "

§ 1173. "Caspar's present mode of living," says his biographer, in the conclusion of his narrative, "is that which is common to most men.—With the exception of pork, he eats all kinds of flesh-meats that are not seasoned with hot spices. His drink continues to be water: and, only in the morning, he takes a cup of unspiced chocolate instead of it. All fermented liquors, beer and wine, as also tea and coffee, are still an abomination to him. If a few drops of them were forced upon him, they would infallibly make him sick."—"The extraordinary and almost supernatural elevation of his senses, has also been diminished, and almost sunk to the common level. He can, indeed, still see in the dark, but not to

read, nor perceive small objects as he once could. Of the gigantic powers of his memory, and of his other astonishing qualities, not a trace remains! He no longer retains any thing that is extraordinary."

§ 1174. That excesses in quantity of food, and many other causes existing in civic life, were to a considerable extent, concerned in producing these deteriorations in Caspar Hauser, there appears to be no just ground of doubt, but it is entirely certain that flesh-meat was the principal cause of the remarkable diminution of his sensorial power, and the abatement of his intellectual activity and energy. For these effects are in precise accordance with the well-ascertained principles of physiological science, and strictly correspond with the facts in all similar cases.

§ 1175. In the ORPHAN ASYLUM of Albany, New York, from eighty to a hundred and thirty children were, in the close of 1833, changed from a diet which included flesh or flesh-soup once a day, to a pure vegetable diet regulated by physiological principles. Three years after this change was made, the principal teacher of the Institution thus speaks of it. "The effect of the new regimen on the intellectual powers of the children, has been too obvious and too striking to be doubted. There has been a great increase in their mental activity and power. The quickness and acumen of their perception, the vigor of their apprehension, and the power of their retention, daily astonish me. Indeed they seem eagerly to grasp, with understanding minds, almost any subject that I am capable of presenting to them in language adapted to their years."*

§ 1176. "On my way to Smyrna, in Greece in 1828,"

* See Appendix, Note A.

says Judge Woodruff, (§ 1007.) "I stopped at Syra, where I was detained by contrary winds about twenty days. I there became acquainted with Dr. Korke, an eminent teacher from Switzerland. He had the charge of the principal school at Syra, containing from two hundred to three hundred pupils. During my stay at Syra, I took great pleasure in visiting this school; which I did almost every day. I very soon began to feel, and express astonishment at the remarkable vivacity, sprightliness and mental activity and power of these children. Their memory was truly surprising. Dr. Korke assured me that he had never, in any country, found children equal to these for clearness, sprightliness and power of intellect,—for aptitude to learn and ability to retain. And, I can truly say that these Greek children manifested a capacity for learning, which exceeded any thing I had ever before or have since witnessed. Dr. Korke attributed this extraordinary ability in his pupils, mainly to their habits, of living, which were extremely simple. Coarse, unbolted wheat-meal bread, with figs, raisins, pomegranates, olives and other fruit, with water, constituted their diet. Figs and other fruit composed a large proportion of their food; but I am confident they did not consume an ounce of flesh a month."

§ 1177. "I spent the winter of 1836-7 on the Island of St. Croix in the West Indies," says Mr. John Burdell, of New York, (§ 720.) "and devoted much of my leisure time to instructing the young slaves. The little field negro children from five to ten years old, which never saw a letter nor had any idea of one till I taught them, on being promised that they should have a Bible given to them if they would learn to read, would, in the course of one week, learn the alphabet and learn to read ba, be, bi, ab, &c. In three or four weeks, they would

learn to read short sentences, such as "No man may put off the law of God:" and in a few months, they would learn to read the New Testament. With all these little field negroes, which lived on corn-meal, yams, peas, &c. there was the utmost avidity as well as aptitude to learn. But the little negroes of the same age in the house, living on what came from their master's table—animal food, &c. are wholly different.—They are totally disinclined to receive instruction and are slow to learn, like our well-fed white children at the north. It is an irksome task to them to apply their minds to study; and they never get a lesson unless they are regularly tasked and urged on. I saw one of these house children which was twelve years old and which had been long under the instruction of the master's daughter, and was just beginning to read a little in the New Testament."

§ 1178. The Rev. Alden Grout, who has recently returned from a three years' mission among the Zulu's on the southeast Coast of Africa, says that that people depend on the products of the soil for subsistence,—living mostly on corn and milk. The children go entirely naked and live in the simplest manner. They are sprightly, active and full of vivacity, and their aptitude to learn is almost incredible. It is a common thing for them, in the course of fifteen months from the first time they ever saw a letter, to learn to read well in the New Testament and to do sums in the fundamental rules of arithmetic. They all discover the greatest eagerness for knowledge; and seem to think nothing so desirable. On leaving them I asked what I should bring them when I returned.—they all cried out at once, "Bring us more teachers!—more books!"

§ 1179. But I shall be told that the Hindoos and other Asiatics, who live on vegetable food, are remarkable

only for their mental imbecility and inactivity: while on the other hand, men of the most gifted minds in Europe, such as Fox, Pitt and others, have been flesh-eaters.— In reply to these objections, I remark that I have already, (§ 1031.) fully accounted for the mental indolence and stupidity of the Asiatics, so far as these statements are true of them. For more than two thousand years, at least, and how much longer we know not, their political, civil, religious and social institutions have been such, as are calculated in the most direct and powerful manner, to suppress and prevent all public and private enterprise, and all intellectual activity and energy, and to produce a general, intellectual and moral stagnancy. To find a relief from this total want of mental and moral stimulation, they have, almost as a natural and necessary consequence, endeavored to give a current to their existence or a tide to the ocean of life, by those sensual stimulations and excitements, of which I have spoken, (§ 1031.) and the excesses of which, have produced all those evils of a physical, mental and moral nature, that are too commonly attributed to a vegetable diet. Yet with all these deteriorating causes co-operating to deprave and destroy them, the Hindoos as a nation, possess great natural talents, (§ 1036.) and among their learned men and philosophers, who with strict temperance subsist on pure vegetable food and water, there have been many as clear and deep and powerful thinkers, as have ever done honor to human nature in any portion of the world. Moreover, it is well known that not only Pythagoras, who is said to have studied with the Bramins of India, but all the most eminent philosophers of antiquity subsisted on a pure and simple vegetable and water diet.

§ 1180. In regard to Fox, Pitt and other Europeans

and Americans who have possessed great intellectual powers and yet were flesh-eaters, two things are to be taken into consideration. First;—in nearly all civilized countries where a mixed diet is used, flesh-meat is very sparingly eaten in the early part of life, or during that period in which the mind is mostly developed and educated: and when once the mental powers are disciplined and the mind furnished with knowledge, though the subsequent habits of the individual may be such as to superinduce general sluggishness and disinclination to mental application and activity and severe and continued employment, yet in moments of strong excitement, the mental faculties may be roused to great activity, and the individual may on such occasions, exhibit astonishing intellectual powers; while as a general habit, his mind is inactive and indolent. Such men are never distinguished for intellectual industry, and seem not to possess the spontaneous power of mental action, and can only make a great effort when excited by great occasions, or by some intoxicating substance which is sufficiently stimulating to overcome their habitual sluggishness. Or if they occasionally do deliberately prepare for an extraordinary intellectual effort, they invariably restrict their diet and become comparatively simple and abstemious, and perhaps for a while, subsist wholly on vegetable food. “Milton studied in Italy, where the diet is olives, macaroni and ice-water, and there laid the plan of his *Paradise Lost*,” says Sir Everard Home.—It is admitted that men who in this manner, ordinarily subsist on a mixed diet of vegetable and animal food *can* possess great intellectual powers: but at the same time, it is contended that they would have possessed still greater powers if they had always subsisted entirely on a pure vegetable and water diet. Second;—there are at least two general classes of

intellect, or kinds of intellectual power. The one is more particularly dependent on the general excitement of the nervous system;—the other, on the pure sensorial power of the brain.—The former is a combination of mind and emotion (§ 586.)—the latter is pure mind.—The former belongs to the orator, the poet, the painter and others who mainly aim to awaken the imagination, the sympathies and passions, and to determine the judgment by the force of feeling, (§ 608.)—the latter belongs to the mathematician, the intellectual and moral philosopher, &c.

§ 1181. It is true therefore, that a man who, like Pitt, eats flesh and drinks wine, may, on particular occasions, when under a strong excitement, pour forth a torrent of impassioned and powerful eloquence, or produce a splendid piece of poetry, or music, or painting,—exciting the sympathies and admiration and astonishment, of all who witness his performance. But let us remember that it is a thousand times easier to make our hearers *feel* with us, than to make them *think* with us; and hence, a thousand will appreciate the powers of the impassioned orator, where one will appreciate those of the profound thinker:—and consequently, mankind always over-rate the impassioned order of intellectual power.

§ 1182. We should remember also, that the extraordinary intellectual power of Pitt and Fox and others of that class, who were free livers, was only occasional;—(§ 1180.) they could not put it forth at will, under all circumstances and in any situation; but always depended on some strongly exciting cause to bring the nervous system into the requisite state of stimulation: and then, like one in a fever, they were able vividly to recollect those impressions which had been stored away at other times, when their habits were better adapted to mental

development and cultivation,—and also, distinctly to produce those conceptions of the mind, (§ 570.) which constitute the ideal presence of things contemplated; and by these means, they were enabled to exhibit the highest degree of intellectual power of which they were capable: and which, after all, is little more than an extraordinary mental paroxysm.

§ 1183. But the mighty minds, which with untiring industry are continually employed, and which with a giant grasp, lay hold of the deep foundations of things, and move the intellectual and moral universe, are of another class. With penetrating and profound and unremitting thought, they explore the heavens and the earth, and scrutinize the forms and properties and laws of things; and with keen analysis and induction, and elaborate reasoning, and rigorous demonstration, sort out the truth and arrange it into the physical and intellectual and moral sciences of the human world. Such minds are not sustained nor excited by flesh and wine.

§ 1184. The mightiest intellectual performance of Sir Isaac Newton, and one of the mightiest of the human mind in any period, or portion of the world, was made while his body was nourished only by bread and water: —and if Bacon and Locke and Boyle and Euler and La Place and a host of other intellectual giants, did not, during their severest mental labors, subsist exclusively on bread and water, it is certain that they were temperate even to abstemiousness, and that their diet was exceedingly simple, and in many, if not in most instances, exclusively vegetable.

§ 1185. Before I dismiss this topic of investigation however, it is important that I should remark on the distinction between the intellectual faculties and the mind itself. —The human soul, I have said, (§ 529.) is an immaterial

substance and constitutes the substratum of the intellectual and moral powers or faculties. The soul and the intellectual and moral faculties therefore, are innate, constitutional principles; but the mind and moral character are wholly the results of the exercise of the innate faculties. Whatever may be the intellectual faculties of the soul, (§ 530.) if they are never exercised, there will be no mind,—if they are little exercised there will be little mind. Now, I do not pretend that a pure vegetable diet will actually produce mind, but that it is most favorable to the development of those organs on which the intellectual manifestations more particularly depend, and most conducive to the healthy and vigorous susceptibility and activity of the intellectual faculties, and, therefore, is most favorable to mental action and power. Thus Caspar Hauser (§ 1141.) at the age of seventeen years, had little more mind than a child of twelve months old,—but as we have seen, (§ 1171.) he possessed the most astonishing susceptibility and activity and energy of the intellectual faculties, which, had they been preserved, would have enabled him to make very great intellectual attainments with ease and delight. A Patagonian youth has also intellectual faculties which it is possible to cultivate to a very considerable degree of mental elevation and power, but he has none of that remarkable susceptibility and activity and energy of the intellectual faculties, possessed by Caspar Hauser, before he began to eat flesh; (§ 1171.) and therefore, it would be incomparably more difficult and laborious for the young Patagonian to make high intellectual attainments, than it would for a youth subsisting wholly on a simple vegetable diet:—and, all other things being equal, it would not be possible for the young flesh-eater, by any labor, to equal the vegetable-eater in the extent of his acquirements.

§ 1186. In the year 1808, a wild boy was found in a swamp in Mississippi, not far from the present site of Pinckneyville. He was first discovered walking naked, on the shore of a lake, hunting frogs, which he dexterously caught and voraciously devoured raw. He was apparently about nine years old, perfectly wild and truculent and without any intelligible language. After he had learned to make himself understood by those who were accustomed to him, he told them that he had a dim remembrance of coming down the Mississippi with his father's family, in a flat-boat,—that his father killed his mother,—and that he fled in terror into the swamps, expecting that his father would kill him also:—and that from that time, he had subsisted on frogs, animals and berries; living in warm weather, among the cane, and in cold weather, in a hollow tree. After this boy was domesticated, he continued to prefer raw flesh to any other kind of food, and soon discovered a fondness for intoxicating liquor, and greatly preferred to go entirely without clothes. He was utterly averse to any kind of employment; and his principal amusement was riding on horseback, of which he was passionately fond. When playing with lads of his age, the moment his anger was excited, his first movement was to strike them with any weapon or instrument he could most readily get hold of.—In short, he proved to be very quarrelsome,—soon became addicted to drunkenness and other vices, and was found to be totally indocile and intractable. A gentleman who saw him in 1825—seventeen years after he was caught, says, “At that time his mind appeared wholly incapable of cultivation. To an entire stranger, his language was unintelligible, consisting of a kind of gibberish, understood, with ease, only by those intimately acquainted with it. He was still an untameable creature,

often found around small ponds catching frogs and eating them raw. It was with great difficulty he could be compelled to wear any kind of clothing or come under any restraint."

§ 1187. This case has been brought forward by the advocates for flesh-eating, to prove that man has a *natural* appetite for animal food and for strong drink; and it is said by them, to be decidedly more of a true case of nature than that of Caspar Hauser. But it is very obvious that neither case can justly be considered as making any very near approximation to the truly natural state of man. It is not claimed that Caspar's dietetic *habits* were the result of natural instinct, and that they prove the natural dietetic character of man: but it is contended that the comparative effects of vegetable and animal food on his physiological and psychological powers, afford the strongest evidence in relation to the natural dietetic character of man; and that evidence is fully corroborated by the evidence in the case of the wild boy of Mississippi. From this boy's account of himself, he must have been at least four or five years old when he fled in terror from his father: and, all things considered, it is scarcely to be doubted that his father was an intemperate man and was intoxicated when he killed his wife. It may therefore, be regarded as a certainty, that the boy had become accustomed to the free use of flesh-meat, and very probably also, to the use of strong drink, while in his father's family: and it is well known that when these appetites are formed in early life, they are generally powerful and abiding: and nothing but strong moral self-control can ever overcome them. The dietetic *habits* of this boy therefore, afford no determinate evidence in relation to the natural dietetic character of man: but the psychological evidence in the case, when com-

pared with that of Caspar Hauser and all other relevant cases, is strong and conclusive: for with his flesh-eating, we find that he had no aptitude to learn—no docility—that “his mind appeared wholly incapable of cultivation;”—that after seventeen years’ intercourse with civilized human beings, his language was a kind of gibberish, unintelligible, except to those who were intimately acquainted with it; and that he continued to be intractable and truculent.

Diet with Reference to Insanity.

§ 1188. It has been reserved for the sagacity of modern philosophers to discover that abstinence from animal food leads to insanity. A physician of considerable professional standing, in an article which appeared in the Boston Medical and Surgical Journal, February 24th, 1836, made a most violent and abusive attack upon me, for propagating the doctrines contained in these Lectures; and asserted that the tendency of the principles which I teach, is to break down the physiological and psychological powers of the human body,—induce insanity and destroy life:—and these bold and imprudent assertions, he endeavored to support by some four or five cases of insanity, which he brought forward with extreme disingenuousness and stated with evident dishonesty. I called on him for further information, and assured him of my readiness to renounce any principles which I had advanced, if I could be convinced of their error; but he utterly refused either to give me the names of the persons whose cases he had adduced, or to afford me the means of investigating those cases, or of coming to any other knowledge of them than I could derive from the hostile statements which he had made in the Medical and Surgical Journal.

Fortunately for the cause of truth and humanity however, the individuals themselves, or the near relatives of the individuals whose cases he had named, proved to possess more moral sensibility and regard for justice, than my adversary manifested, and they spontaneously communicated to me correct statements of those cases. The result was that, every case stated by my assailant, proved to be an entire misrepresentation, so far as it had any relation to an exclusive vegetable diet: and so far as facts could be accurately ascertained, instead of militating against the principles contained in these lectures, they decidedly harmonized with them.

§ 1189. But since the charge has been made, and since popular ignorance and popular prejudice have eagerly embraced and extensively propagated the opinion that an entire restriction to vegetable food leads to insanity, it may be well briefly to inquire how far a change from a mixed diet of vegetable and animal food, with tea, coffee, &c., to a diet of pure vegetable food and water, can possibly be a predisposing cause of insanity.

§ 1190. It is beyond all controversy true, that every human being who abandons an ordinary diet of vegetable and animal food, with tea, coffee, spices, &c., to which he has been accustomed, and takes at once, to a simple diet of pure vegetable food and water, in temperate quantities, will experience a considerable increase of healthy sensorial power and mental activity, (§ 1136.) and at the same time, he will suffer a physiological depression (§ 893.) or atony, commensurate with the degree of excess to which he has formerly carried the use of flesh, tea, coffee, &c. and this physiological depression will be more or less distressing, and continue a longer or shorter time, according to the peculiar condition,

circumstances and habits of the individual.* People of vigorous bodies, who are accustomed to active and energetic exercise in the open air, will recover from it in a short time; while those who are of sedentary and studious habits, given much to anxiety and confinement,—and yet more, those who are of feeble health and impaired constitution, will far more slowly recover. But, while this physiological depression remains, that portion of our organization which is more immediately concerned in the operations of the mind, partakes of the general debility of the whole body: so that, while the *sensorial power* and *mental activity* are increased, the *organic power* of the intellectual organs to sustain severe and protracted *mental action and excitement*, is somewhat diminished,—or at least, not proportionably increased.—Hence students, who from motives of ambition, and other causes, are sometimes induced to make a sudden change in their diet, and take to an abstemious vegetable and water diet, for the sake of being enabled to dispense with exercise, and to make the greatest proficiency in their studies, in a given time, always experience a great increase of sensorial power and mental activity; but if they apply their minds with extreme severity, and especially, if at the same time, they neglect all bodily exercise, they will soon find, to use their own language—“that their minds are becoming weak.” Yet if such students, on changing their diet from more to less stimulating food, &c. would refrain from severe

* By physiological depression or atony, I mean that state of the body resulting from the abstraction of accustomed stimulus, in which the organs are consequently depressed below their usual tone, and fall short of their usual energy and action, causing a sense of debility and lassitude, and sometimes, of great oppression,—and in some instances—as when spirituous liquor is withheld from the habitual drunkard—a distressing sense of sinking and extreme exhaustion.

mental application, till they had recovered from their physiological depression, and then continue to govern themselves by a correct general regimen, they would experience nothing of what they call weakness of the mind,—and which in reality, is weakness of the bodily organs concerned in the mental operations,—but would enjoy a degree of mental vigor and power of endurance which it is impossible for man to attain to in any other way.

§ 1191. Again,—most of the laboring and business people in our country—as everywhere else—exercise their intellectual faculties and develop their intellectual powers little beyond what they find immediately necessary for their success in their particular pursuits of life. A vast amount of intellectual and moral capability lies wholly undeveloped through their earthly existence; and their intellectual and moral energies are, to a very great extent, kept in a state of sluggish inactivity and stupidity, by their dietetic habits and sensual excesses.—Let the habits of these people be suddenly changed, and bring them at once, to a simple diet of pure vegetable food and water, and they will,—if strictly temperate in all things, soon experience such an increase of sensorial power and mental activity, as greatly to astonish them. They will find themselves possessed of faculties and powers which they before, were scarcely conscious of.—There will also be an increase of cheerfulness, vivacity and buoyancy of spirits:—and it cannot be surprising that they should be much delighted with this new state of things.*

* An intelligent farmer of Pennsylvania, whose health had for some time been declining, and who, at the age of sixty years, finding himself completely broken down, and laid by with all the infirmities of a premature old age, was induced to adopt a simple diet of vegetable food and water, with the hope of mitigating in some degree, the severity of his sufferings. Of the effects of this experiment he thus expresses himself. “In less than twelve months from the time I commenced living on my absti-

But this change of diet and increase of sensorial power and mental activity, cannot immediately impart knowledge and discipline to the mind; (§ 1185.) and therefore, it cannot be expected that these people are to be transformed at once, into philosophers and men of science:—but their increase of mental *activity* may only serve to expose more glaringly their want of mental education and discipline, as in the case of the uneducated Irish. (§ 1169.)

§ 1192. Now then, while individuals are in this state of physiological depression, with an increase of sensorial power and mental activity, if some new cause should supervene, such as the loss of friends—of property—of reputation,—religious anxiety,—projects of ambition,—speculations in land and other property, &c. &c.—producing and keeping up intense and continual mental excitement, and causing a neglect of most or all of those principles of general regimen which are quite as important as the quality of the food, insanity might, and perhaps would, in some cases result;—especially where there was a predisposition to that disease. And this would

mious vegetable and water diet, I was perfectly restored to health, and seemed to have renewed my life. I was entirely free from every pain and ailment and was very active and vigorous; and more serenely and truly cheerful and happy, than ever before since my childhood. My sight improved astonishingly, insomuch that, whereas before my change of diet, I could with difficulty see to read with the best glasses I could procure,—now I could easily read the finest print of my newspaper without glasses. But the most wonderful effect was produced on my mind; which became far more clear and active and vigorous than it had ever been before. Indeed, no one who has not experienced the same, can have any adequate conception of the real intellectual luxury which I enjoyed. It seemed as if my soul was perfectly free from all the clogging embarrassments and influences of the body. I could command and apply my thoughts at pleasure, and was able to study and investigate the most abtruse subjects; and to write with an ease and perspicacity and satisfaction which I had never before known nor had any idea of.”

be far more likely to be the case in those persons whose intellectual faculties were not much cultivated, and had been little accustomed to intellectual effort and excitement.

§ 1193. While I admit however, that under these peculiar circumstances, the pure vegetable-eater is more likely to be rendered insane by supervening causes,—which have no necessary relation to his diet—than when he is in the most vigorous state of his physiological powers, yet I must, in solemn honesty, and upon the most fully ascertained principles of science, deny that, it is ever, in any degree, the legitimate tendency of a pure vegetable diet, of itself, to produce insanity; or that, as a general statement, mankind are more likely to become insane by changing, in a proper manner, from a mixed diet of vegetable and animal food, with tea, coffee, &c., to one of pure vegetable food and water;—while on the other hand, it is a well-ascertained matter of science and of fact, that, in civic life at least, the free use of flesh-meat, in itself tends to produce insanity.

§ 1194. More than two thousand years ago, it was taught in the schools of philosophy in Greece, as a well-established fact of experience, and became a generally received doctrine, that “eating much and *feeding upon flesh*, makes the mind more dull and drives it to the very extremes of madness.” (§ 1166.) And from that time to the present day, the whole history of civilized man, has corroborated the statement.—In the rude state of the flesh-eating tribes, where almost every other cause of mental insanity is absent, such a calamitous result is rarely experienced: but in civic life, where almost every thing conspires to reduce the physiological powers of the human constitution,—where continual excitements of body and of mind,—where perplexities, and vexations,

and disappointments, and misfortunes are ever occurring, and all are co-operating to induce and establish an excessive nervous irritability, attended always, with more or less of disturbance and derangement of organic function; and predisposing to bodily disease and mental insanity and madness, it is certain—entirely certain that flesh-meat as a general fact, increases all these evils, more or less in proportion to the freedom with which it is used, (§ 1085.) and greatly aggravates the symptoms of both bodily and mental diseases.

§ 1195. The success which has attended the otherwise improved regimen,—and perhaps still more, the much improved moral treatment of some of our Lunatic Asylums, has, there is reason to believe, greatly blinded the eyes of the public and of the conductors of those institutions, to the real effects of the flesh and opium which are so freely used in them. And while prejudice and empiricism are allowed, by the suffrages of general ignorance, to occupy the high places which belong only to scientific wisdom and skill, we shall probably be obliged to see the theory and practice of professional men, conform to their own sensual appetites and habits, and the unfortunate sufferers who fall under their care, must endure the consequences.

§ 1196. “Dr. Halloran, having been physician to the Lunatic Asylum of Cork from the year 1798,” says Dr. Lambe, (§ 1104.) “states that there are certain festival seasons of the year when the Asylum is supplied with flesh-meat. The consequence on these occasions, has been uniformly the same. The strictest precautions were necessary to guard against a scene of uproar which was sure to follow. The same was the case when the establishment was new and flesh-meat furnished once a week.”

§ 1197. This statement of Dr. Halloran's is in perfect accordance with what we know to be true in physiologico-psychological science, (§ 559. *et seq.*) and what all experiment made upon correct physiological principles, will demonstrate to be true. The human system so readily adapts itself to all sorts of things and habits, that under almost any mode of treatment which is uniformly and regularly pursued, some, of many cases of recent insanity, will be restored to health in spite of whatever particular bad principles and practices may constitute a part of the general regimen adopted: and hence, when the general regimen is in all other respects excellent, as in the institutions to which I have alluded, (§ 1195.) there may be many recoveries in spite of the free use of flesh and opium. But it is nevertheless true that in every case, there is less *certainty* of recovery, and in all cases of recovery under such a mode of treatment, there is a greater liability to a return of the same calamity, than there would be if the mode of treatment were in all respects in strict accordance with correct physiological principles.

§ 1198. Where there is an hereditary predisposition to insanity, I know of no precautionary measure more sure to prevent the development of that most terrible of all earthly calamities, than the intelligent adoption of a simple diet of pure and well-chosen vegetable food and pure water, together with a correct general regimen:—for it is nearly in vain to limit ourselves to any particular kind of diet while in many other respects, our habits are greatly at variance with the constitutional laws of our nature.

§ 1199. Mr. J. C., a highly respectable and intelligent gentleman of Massachusetts, called on me in Boston in January 1836, and stated to me that insanity had been

an hereditary affliction in the family to which he belonged,—that he found himself seriously threatened with it, and had begun to experience many distressing symptoms,—that he attended my lectures in the summer of 1832 and strictly adopted the system of living which I recommended,—that soon after this, he found his health improving in every respect,—his mental disorder in a short time wholly disappeared, and he had ever since enjoyed the most perfect health of body and mind, with a decided and very considerable increase of vigor and activity of both.—I might add a large number of cases similar to this which have come to my knowledge within a few years past. But it is unnecessary. It is already sufficiently evident that a pure vegetable and water diet, under a correct general regimen, is most conducive to that state of perfect soundness of body, on which perfect soundness of mind depends. (§ 589.)

LECTURE XIX.

Comparative effects of animal and vegetable food on the animal propensities and moral sentiments—Relation of the animal propensities and moral sentiments—The doctrine of phrenology—Particular and general relations between the cerebral, and other organs in the body and the wants of the vital economy—Effects of physiological depravity on the propensities and passions—How far the intellectual and moral organs are involved—Means by which the size, activity and vigor of particular cerebral organs are increased—The effects of cultivation or exercise—The effects of diet—The physiological economy, by which the mental, moral and other peculiarities of the parent, are transmitted to the offspring—Comparative effects of vegetable and animal food in developing particular cerebral organs,—and in exciting the animal propensities and passions—Doctrine of phrenology concerning the relative proportions of the brain—This doctrine applied to facts—The shape of the head of the Hindoos and other vegetable-eating portions of the human family, and their natural character—The same principles applied to flesh-eating tribes—Effects of dietetic intemperance on the moral character—particular cases given—Comparative effects of flesh-meat and pure stimulants, on the moral organization and character of man—The testimony of the Sacred Scriptures—The characteristic immoralities of flesh-eaters and of vegetable-eaters—Brief synopsis of the moral organs and their philosophy—Conclusion of the topic—General conclusion from the anatomical and physiological evidence in relation to the natural dietetic character of man.

§ 1200. OUR next, and last department of physiological evidence in relation to the natural dietetic character of man, embraces the comparative effects of vegetable and animal food in developing and strengthening the ani-

mal propensities and passions, and in modifying the moral sentiments.

§ 1201. But here we shall be told that all the propensities, as well as the moral sentiments and intellectual powers are immediately connected with organs which have their seat within the cranium, (§ 533. 534.) and, together, as a complete system, make up the whole encephalic mass, or the whole brain and little brain; and therefore, if it is true that flesh-eating diminishes the sensorial power of the nervous system, and consequently diminishes the functional power of the organs of special sense, and the healthy activity and energy and integrity of the intellectual and moral faculties, it is not easy to perceive why it must not necessarily be true, according to the same physiological principles and reasonings, that flesh-eating will also diminish the propensities and passions.—I will endeavor to explain this point in such a manner as to remove the apparent difficulty.

§ 1202. Granting all that phrenology claims in regard to the cerebral organs, (§ 543.) it must nevertheless, be remembered that there are very important distinctions between the constitutional relations and functional powers of these different organs;—some of them holding special relations to particular corresponding organs in other parts of the body,—others holding general relations to the physiological wants of the system, and others holding general relations to the social and moral circumstances and conditions of man.—Thus, suppose that, according to the conjectures of phrenologists, there is situated somewhere in the brain, an organ of alimentiveness; (§ 544.) this has a particular corresponding organ in the abdominal cavity, which is the stomach:—this latter organ, according to its constitutional laws of relation, takes on a certain physiological condition, (§ 599.) demonstrative

of a particular want of the system:—this physiological condition of the stomach is perceived by the cerebral organ of alimentiveness as the special centre of animal perception of that special sense, and being thus perceived by this animal centre or cerebral organ, it is what we call hunger, or desire for food,—and this, appealing to other organs of the brain, calls into action those whose functions are necessary in order to the gratification of the desire.

§ 1203. Now then, according to the philosophy of phrenology, the grand, fundamental element in the functional character of the organ of destructiveness, is the supply of this alimentary want, (§ 544. No. 3.) and consequently, this organ sympathizes with—or partakes of the excitement of that of alimentiveness, and is thereby roused to the performance of its function; which is to urge on the animal to destroy that which is necessary to gratify the propensity of hunger, and thus supply the general alimentary want of the system: and hence, beasts of prey are always more ferocious and cruel when hungry than when they have fully gratified their appetite for food:—and all other animals, including man, are more irritable and apt to become angry when hungry than when the stomach is full.—It is not however, by any means *necessary* to call in the aid of phrenology to account for any of these facts. But I admit the premises for the sake of meeting the objection on the ground where it is set up.—And from the statement I have made, we perceive that the organ of destructiveness, has a general relation to the physiological wants of the system; (§ 1202.) and that so long as it retains its primitive functional character and integrity, it always and only acts consistently with the general physiological interests of the system. All this is

true of the organs of combativeness, acquisitiveness and all the other propensities. (§ 544.)

§ 1204. But the stomach may be so affected as entirely to destroy the integrity of that physiological condition which demonstrates the alimentary wants of the system, (§ 767.) so that, the sense of hunger may become a mere demand for accustomed stimulation, and in no degree, indicate the true alimentary wants of the body, (§ 737. 738.) And this morbid appetite is always the more despotic and imperious, in proportion as it is removed from the original integrity of the function. (§ 608.) Moreover, this condition of the stomach always involves the whole nervous system; (§ 298.) and increases the irritability of all those cerebral organs whose functions, according to phrenology, constitute the propensities common to man and lower animals. (§ 544.) The consequence is that, destructiveness, combativeness, secretiveness, acquisitiveness, amativeness, alimentiveness, and other organs holding special, or general relations to the physiological wants and conditions of the body, lose their original integrity in reference to those wants; and act in relation to the depraved physiological condition and affections of the system; and by such action necessarily increase, not only their irritability, but their tendency to excess and violence;—and thus, the organs which were originally instituted and endowed for the good of individual and social man, are by depravity made to urge him on to restless dissatisfaction, and contention, and deceit and lying, and cheating and theft, and quarrelling and cruelty, and murder and war. For, it is an important fact that these crimes are far less frequently committed from any real, extrinsic exciting motive, than from the internal condition of the nervous system; and hence, a large proportion of the murders and manslaughters and

thefts and other crimes committed in our country, are connected with the use of intoxicating liquors.

§ 1205. The organs of the intellectual and moral powers, are so far involved in the condition of the other cerebral organs, as to partake in common with them, of the general state of the nervous system, and their peculiar functional powers, as we have seen, (§ 1130.) are always proportionably impaired by whatever diminishes the healthy sensorial power of that system:—but the perceptive and reflective faculties, and the moral sentiments, such as benevolence, veneration, conscientiousness, &c. do not hold those important, special and general relations to nutrition and other functions within the domain of vegetative or organic life, (§ 283.) which render them particular cerebral centres of perception to the special or general physiological wants of the vital economy, in like manner with alimentiveness, destructiveness, combativeness, &c. Hence, though the causes which increase the determinate functional action and the irritability of these latter organs, involve the former, in the general increased, and perhaps morbid irritability of the whole nervous system, (§ 305.) yet they never directly tend to produce their determinate functional action: as in the case of the organs of the propensities.—Thus, physiological dissatisfaction in the domain of organic life, always leads to more or less of disquietude and restlessness and impatience and testiness and anger and contentiousness and perhaps violence and crime: and it excites the intellectual faculties, (§ 547. 548.) so far as its own gratification requires their action, and this, always and exclusively, to secure such gratification, and never to oppose it in any measure:—(§ 605.) and it perhaps excites cautiousness, but only to produce unhealthy and generally, vague and indefinite apprehension and fear:—and it ex-

cites the other organs of sentiment; and renders them, during the excitement, more morbidly, susceptible of the action of other causes; but it never of itself, tends determinately, to produce the function of benevolence, veneration, &c., but always the contrary.

§ 1206. It is true that, when a long-continued over-excitement of a moral or religious nature, has induced a preternatural or morbid irritability and mobility in the organs of veneration, marvellousness, hope, conscientiousness, cautiousness, &c., a general stimulation of the nervous system, through the medium of the domain of organic life, will always increase the action of those organs in relation to the particular moral or religious subject which they have become accustomed to contemplate; —but such increased action will only continue while the direct stimulation continues, and be followed by a commensurate degree of exhaustion, depression, debility and increase of morbid irritability, tending to derangement of function, and inflammation and change of structure in the organs;—hence, it always necessarily tends directly and indirectly to induce or aggravate monomania, or general insanity. (559. *et seq.*) It is true also, to use the language of phrenology, that when the organs of benevolence, adhesiveness and others of this class of character, are exceedingly large and very greatly predominate, the stimulation of alcoholic, narcotic and other pernicious substances, if kept within certain bounds, will, for a while, produce an increased manifestation of kind, and perhaps excessively generous and foolishly fond feeling: but the ultimate and more permanent effects of such stimulations, always tend to produce that general morbid irritability of the nervous system, which sooner or later transforms the unfortunate individual into a demon of anger and cruelty and violence. It is not therefore, so

much the momentary effects of direct stimulation on the cerebral organs, as the permanent and constitutional effects, which it concerns us to investigate on the present occasion.

§1207 According to phrenology, the particular organs of the brain, may not only be rendered morbidly irritable, in the manner I have described, but by certain means, their healthy energy and activity may be very considerably increased;—and by certain means also, the organs themselves may be very much enlarged, so that, a single organ may be made to have a very modifying and even predominating influence in the character of the individual. It is notoriously true also, that the peculiarities of character in the parent are very often manifested in the child; and this too, under circumstances which entirely exclude the possibility of their being derived by imitation. Phrenology affirms that in such cases, the child inherits a cerebral organization corresponding with that of the parent whom it resembles in character.

§1208. Two problems then, present themselves for solution.—The first is,—by what means does the individual increase the size and activity and vigor of particular cerebral organs in himself?—and the second is, by what means are the peculiarities of cerebral organization in the parent transmitted to the child?

§1209. In regard to the first problem, phrenology affirms that all exercise of the cerebral organs which does not become so excessive as to induce morbid condition, increases the activity, vigor and size of the organ or organs exercised. Thus if benevolence be much exercised the organ will become proportionably more active, vigorous and large; and so of each and all the other organs of the brain,—and in this manner the individual may greatly increase the size, activity and vigor of a

single organ or of several organs, and wholly neglect the cultivation of the other cerebral organs, and thereby exceedingly modify, and give a permanent shape to his character;—making himself a sly, cunning, crafty knave, or an avaricious miser, or a thief, or liar, or a quarrelsome, turbulent fellow, or a morose and cruel wretch, or a blood-thirsty murderer;—or making himself a devoted philanthropist or a profound philosopher, &c.

§1210. Admitting phrenology to be true, such exercise of the cerebral organs, certainly does increase their activity and vigor, and unquestionably also, it increases to a certain extent, their size or volume;—but I think phrenologists have erred in making this the too exclusive means of development; and in depending too entirely on mental and moral discipline and education, to bring forward or retard the growth, and increase or diminish the relative activity and vigor of particular organs. It has been the boast of phrenology that it could afford the only rational explanation of monomania; (§ 558.) and that it had done much for the cause of humanity, in pointing out the only true and philosophical mode of treating that disease and other species of insanity;—but after all that has been said about topical applications to diseased organs, phrenologists and all others, will soon find,—if indeed they have not already found, that the grand point to which the physician must direct his attention in the treatment of every species of chronic insanity, is the alimentary canal. (§ 598. Note.)—And this is true to an almost equal extent, in regard to the proportionate development and power and activity of the several organs of the brain.

§ 1211. Be it remembered however,—I do not discard intellectual and moral discipline and education, as means by which these effects are to be produced:—on the

contrary, I insist upon them as of the utmost importance;—but I contend that they should go hand in hand with the strict fulfilment of the laws of constitution and relation appertaining to the digestive organs and to the domain of organic life generally.—I contend that it is nearly if not entirely in vain to attempt, by moral discipline and education, to develop benevolence or suppress destructiveness while all the dietetic habits of the individual are operating directly against us. It is like attempting, when a building is on fire, to quench the flames by throwing upon them a quantity of water with one hand, and a quantity of oil with the other.

§ 1212. All pure stimulants, or those substances which stimulate without nourishing, (§ 743.) increase the general irritability of the nervous system;—and all alcoholic, narcotic and other deleterious stimulants, always produce more or less of morbid irritability in the system, according to the extent to which they are used.—The action caused by such means, never healthfully increases the size of any organ or organs thus excited. But as we have seen, (§ 1205.) it always increases the influence of certain cerebral organs over the others,—always tends to cause a predominance of the more exclusively selfish propensities over the intellectual and moral faculties.

§ 1213. There are some kinds of aliment by which the body may be nourished and sustained, and which, from their adaptation to the organization and physiological properties, powers and laws of the system, naturally tend to such a symmetrical and harmonious development of the several portions of the brain as well as of every other part of the body, as the highest and best condition of man as an individual and as a social, intellectual and moral being requires;—and there are other kinds of aliment by which also, the body can be nourished and sustained, but

which, being less perfectly adapted to the general physiological interests of the system, always naturally tend to develop some parts more rapidly and fully than others, and thus, to impair the symmetry and harmony of the system. And from what has already been said, it must be perfectly obvious to every physiologist, that, whatever aliment increases the appropriation of nervous energy to the organs concerned in the general function of nutrition and in the perpetuation of the species, beyond what is indispensably necessary to the most perfect performance of the functions and the most complete fulfilment of the finalca uses of those organs, always necessarily increases the power of those physiological conditions of the organs which, being perceived by the animal centre or centres, constitute the more exclusively selfish animal propensities; and consequently, if phrenology be true, the cerebral organs with which these propensities are connected, will be proportionably increased in size, vigor and activity.

§1214. For, be it known and remembered, as a matter of the utmost importance in physiological and psychological science, that, admitting phrenology to be true in regard to the organization of the brain, the cerebral organs have nothing to do in modifying the peculiar physiological powers and functional character of corresponding organs in the domain of organic life, (§1202.) in the original development of the system:—but directly the contrary, is true: (§ 217. *et seq.*)—that is, the peculiar physiological character of particular organs in the domain of organic life, involving the whole condition and economy of that domain, causes a proportionate development, vigor and activity in the corresponding cerebral organs:—and those cerebral organs of animal instinct or propensity, which have no particular corresponding organs in the domain of organic life, but hold a more general relation

to the wants and conditions of that domain, are also proportionably developed by the general physiological condition and economy of that domain.

§ 1215. Dietetic as well as intellectual and moral causes are therefore, largely concerned in regulating the general proportions of the brain, and in increasing the relative size, vigor and activity of particular organs.

§ 1216. But when, by any means, an individual has produced a large development and a high degree of vigor and activity of certain cerebral organs, by what means does he transmit his own cerebral peculiarities to his offspring?

§ 1217. I do not know that phrenology has attempted a solution of this problem, but I am sure that on its own peculiar grounds, it can afford none that is satisfactory. The brain of the parent can have no direct influence on the development of the brain of the child.—All that the parent can impart of his own substance or properties to the offspring, must, even in himself, pass through those vital processes over which the nerves of organic life exclusively preside; and so far as it acts in controlling or modifying that vital economy by which the body of the offspring is developed, previously to its own voluntary agency, it acts exclusively in and through the nerves of organic life (§ 228.) belonging to the body of the child, and in no degree in and through the brain or any of the nerves of animal life. For, as I have fully shown, (§ 234.) the nerves of organic life exclusively preside over all the functions concerned in the development of the body;—the nerves of animal life being entirely passive, at least until respiration and alimentation commence; (§ 233.) and then only active in certain organs of external relation, as mere instruments by which certain foreign substances are brought within the sphere of the vital

action of the organic domain, &c. Indeed, as we have seen, (§ 215.) the brain and spinal marrow are in no degree essential to the perfect development of the body in every other part:—and hence, in the normal state, the brain is among the very last portions of the whole system, which become so completely organized and confirmed, as to be capable of performing their appropriate functions. (§ 214.)

§ 1218. All the peculiar cerebral effects produced in the original development of the body, therefore, must result exclusively from causes acting in and through the nerves of organic life; and these causes originate mostly, from the intellectual, moral, dietetic and other voluntary habits and actions of the parent. But whether arising from one or all of these, they necessarily, in all cases, affect the offspring by first affecting the physiological condition and economy of the domain of organic life in the parent himself, and through this medium, are transmitted to the nerves of organic life in the offspring, where they act to modify the development of the several organs belonging to organic life, and impart to them a physiological condition and character corresponding with the state of things in the parent:—and then they proceed to produce a cerebral development corresponding with the physiological condition and character of the domain of organic life in the offspring. (§ 1214.) Hence, the parent may, by his dietetic and other voluntary habits and action so affect his own nerves of organic life, as to produce a strong constitutional predisposition in his offspring to pulmonary consumption and other diseases,—or to insanity, without actually inducing those diseases in his own body,—or suffering that affliction in his own mind. Or he may, by such means, produce a large development of destructiveness, combativeness, secre-

tiveness, acquisitiveness, amativeness, and other organs of this class, even though these organs are of moderate size in his own head.

§ 1219. It is therefore, perfectly evident, as I have asserted, (§ 306.) that all hereditary predispositions and peculiarities are transmitted from parent to child—from generation to generation, exclusively through the medium of the nerves of organic life:—and through this constitutional medium, God visits the iniquities of the parents upon the children unto the third and fourth generation; and remembers mercy to the children of those that love him and keep his commandments, equally long.

§ 1220. With these explanations before us, we are prepared to enter more particularly upon our inquiry concerning the comparative effects of vegetable and animal food in developing and strengthening the animal propensities and passions, and in modifying the moral sentiments.

§ 1221. We have seen (§ 976.) that a pure vegetable diet is more conducive to the symmetrical and harmonious development of each and every part of the human body, than animal food.—We have seen also (§ 919.) that flesh-meat is decidedly more stimulating and heating than proper vegetable food, and that it quickens the pulse, increases the heat of the skin, accelerates all the vital functions, hastens all the vital processes of assimilation and organization, and renders them less complete and perfect: (§ 924.) and consequently, develops the body more rapidly and less symmetrically,—exhausts the vital properties of the organs considerably faster and wears out life sooner. Furthermore, we have seen, (§ 921.) that flesh-meat causes a much greater concentration of nervous energy in the several organs through which it passes in all the successive processes of assimilation,

than proper vegetable food, (§ 919.) and consequently leaves those organs more exhausted from the performance of their functions, and causes a greater abatement of the sensorial power of the nerves of animal life; and if phrenology be true, it causes a greater concentration of that power in those cerebral organs which are constitutionally and functionally most nearly related to the viscera of organic life. (§ 1202.)

§ 1222. It follows therefore of necessity, that, flesh-meat increases the power of those physiological conditions and affections of the viscera of organic life, which, being perceived by the animal centre or centres in the brain, constitute the animal instincts or propensities; (§ 605.) and also, increases the action and relative force and size of those parts of the brain which, according to phrenology, are the organs of those propensities. (§ 1213.)

§ 1223. The controlling power of that instinct which we call hunger, on the intellectual and moral faculties, is much greater and more imperious in the flesh-eater, than in those who subsist on a pure vegetable diet. (§ 608.) If the flesh-eater is deprived of his customary meals or supplies of food, he feels a degree of gastric depression which is often painful, and is always attended with more or less of restless dissatisfaction, (§ 921.) which, to speak phrenologically, appeals to the organs of destructiveness and combativeness, and others of that class, and tends to excite them to vigorous action, in order to relieve the instinctive disquietude and distress: and hence, men, in this state, often burst into fits of anger with their wives, or children, or domestics, and sometimes commit acts of violence, without the slightest provocation from those toward whom their wrath is manifested. But the pure vegetable-eater, though he experiences, according to his habits, as to times of eating, a regular recurrence of his

appetite for food, yet it has nothing of that despotic, velment and impatient character, which marks the craving desire of the flesh-eater; and he can lose a meal with very little dissatisfaction; and can even fast for days with comparatively little distress or disquietude. And all this difference is true between the flesh-eater and the vegetable-eater, in relation to all the more exclusively selfish propensities in man. (§ 921.)

§ 1224. It is one of the most important doctrines of phrenology, that the greater the proportionate width of the head between and back of the ears,—and depth from the ears to the back of the cranium,—or in other words, the more the portions of the encephalic mass lying in the lower and back part of the skull, exceed those lying in the upper and fore part,—the more the animal propensities will predominate, and the more active and powerful will be the selfish and evil passions:—and, as I have stated, (§ 1203.) one of the principal final causes, assigned by phrenologists, for the organ of destructiveness, which increases the width of the head between the ears,—is the alimentary wants of the body, requiring the destruction of life in other animals for their supply. And hence Gall and Spurzheim infer the carnivorous character of man from his cerebral organization. And yet Spurzheim admits that the organ of destructiveness is, in general, relatively largest in infancy, when flesh-meat is not wanted, and when it would not be proper.

§ 1225. But admitting the doctrine of the width and occipital depth of the head as connected with the more exclusively selfish propensities and mischievous passions,—there is one general fact in relation to the subject, of great interest, and worthy of much consideration. The Hindoos and other Asiatic tribes who, from their earliest history, have subsisted wholly on vegetable food, as

a general fact—and especially those portions of them who have preserved most of their primitive simplicity, purity and temperance, are proportionably much narrower between the ears, than those portions of the human race, who have, for many generations, fed freely on flesh.—The question therefore is, whether the Hindoos have, from time immemorial, abstained from the use of flesh-meat, and adopted a system of religion which forbids the use of it, because they were originally, and always have been proportionably narrow between the ears, or whether this shape of their heads, is the effect of their abstinence from flesh through so many generations?

§ 1226. I imagine that no one will hesitate to say that, if either of these propositions is true, it is unquestionably the latter. That is,—the proportional narrowness of the head, as a national fact, is the effect of their subsisting purely on vegetable food:—and if this be admitted, the fact, according to the theory of phrenology, is very conclusive on the score of morality:—and fully proves that no physiologist ought, for a moment, to doubt that flesh-eating tends decidedly to increase the development of the more exclusively selfish propensities in man, and to promote the action and power of the evil passions.

§ 1227. As a general fact, it is true of all those tribes, in savage life, which subsist principally upon flesh, that much the greater proportion of the brain lies in the lower and back part of the skull. This may be said to be owing to the want of education to develop the intellectual and moral organs, lying in the front and upper part of the head:—but I reply, that as a general fact, it is true of all those tribes in savage or uncivilized life, subsisting mostly or entirely on vegetable food, that the brain is much more symmetrically developed and a far greater

proportion lies in the upper and fore part of the skull, than in the heads of the flesh-eating savages.

§ 1228. Admitting however, that regular moral and intellectual cultivation from generation to generation, will increase the relative proportion of the upper and front part of the brain, in flesh-eaters, yet the fact that without such intellectual and moral means of cerebral development, the lower and back parts of the brain naturally and greatly predominate, proves conclusively that these parts in point of function and development, hold nearer and more special relations to the primary wants of man as a mere animal: and consequently that, whatever tends as a permanent fact, to increase the concentration of the healthy vital energies in those parts which are concerned in the development, sustenance, and perpetuation of the material organization, always necessarily tends also, to increase the relative proportion of the lower and back part of the brain. And the fact that, in those tribes destitute of intellectual and moral cultivation, or in the uncivilized state, which subsist principally or entirely on pure vegetable food, the brain is more symmetrically developed, and the upper and front parts are much larger in proportion to the lower and back parts than in the uncivilized flesh-eaters, proves conclusively that flesh-meat increases the relative size and power of those cerebral parts which according to phrenology are the organs of the more exclusively selfish propensities, and tends to cause the animal, to predominate over the intellectual and moral man (§ 617.)—while a pure vegetable diet, without neglecting to secure, by the most complete and harmonious organization and perfect physiological endowments, all the interests of organic life and animal instinct, at the same time, naturally tends to produce that symmetry of particular and general development and har-

mony of parts, which give comeliness and beauty to the person (§ 974.) and fit man as an intellectual and moral being, to understand and appreciate and fulfil his duties to himself and his relations to his fellow creatures and to his God. (§ 613.) Hence, the notorious fact, that in the perfectly rude and uncultivated state of man, the vegetable-eating tribes and nations never sink so low on the scale of humanity,—never approach so near to an utter extinction of the intellectual and moral faculties,—never become so deeply degraded and thoroughly truculent as the flesh-eating tribes. However rude the state of the uncivilized vegetable-eater, he always, other things being equal, manifests more intelligence, more moral elevation, more natural grace and urbanity than the flesh-eating savage. This fact has been observed by travellers and writers from the days of Homer to the present time.

§ 1229. That those portions of the brain which, according to phrenology, are the organs of the propensities, hold a more immediate and particular relation to the physiological condition of the nerves of organic life, than the intellectual and moral organs do, may be strongly illustrated by particular cases. F. R., of M., was an affectionate husband, a kind father, a peaceable neighbor, and a worthy member of society. Following the universal custom of the times, of sipping intoxicating liquor on all occasions, with every one he met, he gradually became more and more addicted to the use of ardent spirit, till he fell into occasional excesses. These excesses were soon marked by a great change of character; and finally, by a fearful exhibition of the destructive propensity. On one occasion, while under the influence of intoxicating liquor, he entered his house and finding his wife nursing her infant, he deliberately fastened the doors and windows and then got a butcher's knife and whet-stone and sat

down and began to whet his knife, and at the same time told his wife that she had but a few minutes to live, for it was his determination to kill her and her child. She calmly asked him if he would permit her to lay her child on the bed before he executed his design. He assented, and she stepped into the bed-room, laid her child down, and sprang upon the bed and threw up a window behind it, which was not fastened, and escaped to the neighbors. Ever after this, measures were taken to protect his family from his outrages when he came home under the influence of ardent spirit. But on all such occasions for more than twenty years, he invariably discovered the strongest propensity to murder his wife and children. Yet at all other times he was perfectly kind and affectionate to his family, and peaceable towards every body, and a good member of society: and after the Temperance Reform induced him wholly to abstain from the use of intoxicating liquors, his cruel and murderous propensity entirely disappeared, and his character and behavior were uniformly good.

§ 1230. The pirate Gibbs, who according to his own confessions, was one of the bloodiest murderers of modern times, had a head which would lead every intelligent beholder to take him for an extraordinary man. The first thing that struck the eye of the phrenologist was his towering benevolence, and then his large veneration, and still larger conscientiousness and firmness and cautiousness, and large philoprogenitiveness and adhesiveness; and his capacious and well-marked forehead indicating a high order of intellect and a splendid imagination, and all this associated with a finely formed and harmonious and interesting countenance. But on further examination, the phrenologist could also discover very large destructiveness and combativeness and amativeness and acquisi-

tiveness.* Now then, how shall we reconcile the actual character of the man as a pirate and extensive murderer, with this cerebral development?—I reply that phrenology, or more properly speaking—craniology cannot do it satisfactorily. There were very large destructiveness and combativeness and acquisitiveness, it is true, but there was certainly sufficient intellectual and moral development to control these propensities, and out of the whole cerebral organization, to produce a highly exalted, efficient and most estimable intellectual and moral character, if due attention had been paid not only to intellectual and moral discipline and education, but to the true relations between the cerebral organs and functions, and the physiological conditions and affections of the domain of organic life. (§ 1202.) So long as the dietetic habits of Gibbs were correct, (even in the ordinary sense of the term,) he had no disposition to murder nor to be cruel nor quarrelsome; but when he had developed a high state of irritability in his nervous system by the habitual use of stimulating and intoxicating substances; and, when in this condition he brought his whole system under the powerful stimulation of ardent spirit, then, as he himself declared, he felt the demon of his destiny urging him on

* False casts of the head of Gibbs, modified to correspond phrenologically with his character as a pirate and a murderer, have been extensively circulated; but the analysis which I have given in the text is strictly according to Gibbs' own living head, and according to the true cast of his head taken by Coffee under the gallows immediately after he was cut down. This analysis shows that Gibbs was not a pirate and a murderer from a natural necessity arising from his cerebral organization, but from a moral necessity arising from his voluntary depravity; —for destructiveness was not proportionably larger in the head of Gibbs than in the head of Spurzheim. And this view of the subject, besides being the true one, fully exonerates phrenology from the charge of *fatalism*, which has ever been considered its most odious feature. (§ 639.)

to wickedness and violence. (§ 1204.) Yet when this stimulation has passed away and the irritation of his nervous system is permitted to subside, we find reflection and conscientiousness and veneration and benevolence, all busily and powerfully at work to redeem him from his vices and his crimes; filling his soul with deep contrition and tenderness, and kindness, and feelings of affectionate dutifulness, all prompting him to the best resolutions for the future;—but then would return upon him the temptations and the appetite to drink intoxicating liquors, and with their stimulation the demon of his ruin possessed his soul again, and immediately his conscientiousness and veneration and benevolence and all his better feelings were hushed and destructiveness and combativeness and other selfish and cruel propensities and lusts ruled his whole nature.

§ 1231. Now I ask, why it was that his moral sentiments were not equally excited with his more exclusively selfish propensities, by the stimulation of the ardent spirit; and why they did not maintain that relative degree of influence on the conduct and character of the individual at such times, which they exerted when the nervous system was free from the stimulation and irritation of the spirit? For, we see that, according to Gibbs' own confession, when he was under the influence of ardent spirit, combativeness and destructiveness were the ruling elements of his character;—but when he was wholly free from the influence and effects of intoxicating substances, those elements no longer exerted their controlling sway within him, but gave place to conscientiousness and benevolence and other elements of this kind. Surely, if all the cerebral organs held the same relation to the physiological conditions and affections of the domain of organic life, all of them must be equally excited to action by the general stimulation of the nervous system:—and in such

a case, if the stimulation of alcohol considerably increased the functional energy and action of the organ of destructiveness, combativeness, &c., it would increase in exact proportion, the functional energy and action of the organ of benevolence, conscientiousness, &c. So that, so far as the cerebral organs were affected through the medium of the domain of organic life, the relative influence of the several organs would be preserved in all states of the system;—all being equally increased in energy and action by general stimulation, and all suffering an equal abatement of that energy and action, as the stimulation subsided;—and thus, Gibbs and every other man, so far as the causes which we are now considering are concerned, would always have the same relative degree or force of propensity to contention, and cruelty and destruction, &c., and the same relative force of benevolence and veneration, and conscientiousness, &c., whether the nervous system was under the powerful stimulation of alcohol, or only under the bland and healthful stimulation of appropriate aliment. And the various intellectual and moral causes in life, alone, could excite particular cerebral organs and arouse one or more to a high degree of functional energy and action, while others remained inactive and quiet. But the cases which I have presented, and thousands of other similar facts continually met with in the history of man, as well as every true principle of human physiology conclusively demonstrate the error of such a notion: and clearly and incontrovertibly prove that, if phrenology be true in regard to the organization of the brain, the organs of destructiveness, combativeness, acquisitiveness, &c. hold nearer and more special functional relations either to particular organs or apparatuses in the domain of organic life, and through them to the general economy of that domain,—or immediately to the

general economy itself, than the intellectual and moral organs do.

§ 1232. And hence it may be predicated as a general law, that whatever increases the stimulation of the domain of organic life beyond what is essential to the most healthy and complete performance of the functions of that domain, always increases the direct influence of that domain on the cerebral organs. (§ 605.) And again, it may be predicated as a general law, that, whatever increases the direct influence of the domain of organic life on the cerebral organs, proportionably increases the influence of the propensities over the intellectual and moral faculties: (§ 608.)—rendering it more difficult for the understanding to weigh correctly the evidence which is presented to it, and to arrive at conclusions of truth:—and more difficult for the moral faculties to preserve their functional integrity. (§ 630.)

§ 1233. But I have clearly shown (§ 925. 926.) that pure vegetable aliment is sufficiently stimulating to excite the system to the most healthful and complete performance of all its functions; and that flesh-meat is decidedly more stimulating and heating than proper vegetable food (§ 916.) and increases, in man, the force or power of those physiological conditions in the domain of organic life, which being perceived by the cerebral centre or centres, constitute the animal instincts or propensities; (§ 1213.) and consequently increases the influence of those propensities over the intellectual and moral faculties. (§ 608.)

§ 1234. There is however, an important distinction to be observed between flesh-meat and pure stimulants, (§ 743.) whether of a deleterious character or not.—Flesh-meat, like pure stimulants, but in a much less degree, increases the general stimulation of the nervous

system, and the exhaustion of the vital properties and organized substances of the body;—but here, all resemblance between them ends. The pure stimulants almost without exception, produce direct irritation as well as stimulation, and the ultimate exhaustion which they cause, always results in increased irritability: and all the poisonous stimulants such as the alcoholic, narcotic, &c. produce a still greater degree of direct irritation, and directly impair the vital properties of the organs, and cause a far greater degree of irritability. The pure stimulants therefore, not only stimulate the nervous system while their direct influence continues, but they also—and particularly the deleterious,—produce a permanent irritability of the system, which is often of a highly morbid character, rendering the system extremely irritable under the action of other causes, physical, intellectual and moral; but as they only serve to exhaust the vital properties and waste the organized substances of the body, without affording any nourishment in return, they do not increase the size of any part of the system but rather tend to diminish the whole. Flesh-meat, on the other hand, in a healthy system that is accustomed to it, nourishes as well as stimulates, and therefore, replenishes the exhaustion and repairs the waste which its stimulation and the consequent action occasion, and without producing that preternatural irritability which results from alcoholic, narcotic and other pure stimulants of that general class. And, by affording a high order of stimulating nourishment to the system, it not only increases the power of those physiological conditions and affections in the domain of organic life which being perceived by the cerebral centre or centres, constitute the animal instincts or propensities of a more exclusively selfish character, (§ 1213.)—but it also naturally, if not necessarily, in-

creases the relative size of those cerebral organs which hold the most immediate and special functional relations to particular organs in the domain of organic life or to the general wants and economy of that domain. (§ 1202.)

§ 1235. But size alone, does not necessarily give an organ a proportionate influence in the cerebral system. An individual for instance, may have a very large organ of benevolence and moderate destructiveness and combativeness, yet all the habits and circumstances of that individual, may co-operate to keep his combativeness and destructiveness in constant exercise, and to prevent the action of his benevolence. Another individual may have large combativeness and destructiveness and moderate benevolence, yet all his dietetic and other habits and circumstances may be such as exert a quieting influence on his organs of combativeness and destructiveness, and a constantly exciting influence on his benevolence. In each of these cases the actual moral character of the individual will differ from the phrenological character of the head, and this is frequently the case. I have often found much better heads, phrenologically speaking, on convicts in prison, than I have found on some excellent members of society.

§ 1236. From all the considerations which I have presented on this subject therefore, I am constrained to regard *that* system of fortune-telling which depends on the proportions and prominences of the head, as extremely uncertain, and of very questionable utility, even at best; and as capable of being made exceedingly injurious in its effects on society. Phrenology—admitting all that it contends for concerning the anatomy of the brain, can only become a true and complete science by embracing the whole human system with all its physiological proper-

ties and powers, conditions and relations, and then it will become INTELLECTUAL AND MORAL PHYSIOLOGY.

§ 1237. In regard to the comparative effects of pure stimulants and flesh-meat then, the latter tends to increase the relative *size* of the lower and back parts of the brain, or of the cerebral organs of the animal propensities; but without necessarily making men quarrelsome and cruel and destructive. If their dietetic and other habits are in other respects simple and correct, and their general circumstances favorable to a pacific and kind temper, they may seldom or never outrage the laws of society in its simplest and rudest forms. The pure stimulants, and especially the alcoholic and narcotic, &c., on the other hand, without increasing the size of the organs, always greatly increase the action and depraved energy of the more exclusively selfish propensities, and tend to make men quarrelsome, cruel and destructive; (§ 1212.) and when freely used by those in whom the organs of these propensities are relatively large, they are sure to transform them to incarnate demons of wickedness and violence. (§ 1230.)—In the uncivilized state therefore, flesh-eaters who, like the Patagonians, (§ 981.) are rarely able to indulge in alcoholic and narcotic substances, and who, in other respects, have little to produce a preternatural or morbid irritability of the nervous system, may live together in small tribes, with comparatively little exhibition of the fiercer and more cruel and wicked and violent passions:—but flesh-eating savages who indulge freely in tobacco and ardent spirit, and other like stimulants, are always extremely fierce and cruel and blood-thirsty—delighting in violence and murder. While on the other hand, those uncivilized tribes and nations, which subsist wholly on vegetable food and indulge freely in alcoholic and narcotic substances, never become thus fierce and cruel and blood-

thirsty.—And it is only when the vegetable-eating natives of India and the islands of the ocean, have tortured themselves to the fiercest extremes of suicidal madness, by their excess in opium and arrack and other pernicious stimulants, that they rush furiously forward in the work of violence and destruction and seem equally intent on giving and receiving death. (§ 1031.)

§ 1238. So far as physiological and moral evidence can go to establish the point therefore, there is the strongest reason to believe that the antediluvians, immediately preceding the flood, indulged to great excess in both flesh and wine:—for such a diet only, could produce the enormous wickedness and violence recorded of them. If the Patagonians were as numerous as the Hindoos and as densely crowded together, and indulged as freely in the use of alcoholic, narcotic, and other intoxicating and stimulating substances, the wickedness and violence which would prevail among them, would exceed all description, and all power of imagination.

§ 1239. Whether phrenology be true or false then, it remains equally true that, flesh-meat, more than proper vegetable food, develops and strengthens the animal propensities and passions,—and especially those of a more exclusively selfish character:—rendering man more strongly inclined to be fretful and contentious and quarrelsome, and licentious, and cruel, and destructive, and otherwise vicious and violent and ferocious.—If any dependence can be placed on the statements which have come to us from reputable authority, even the tiger, if taken very young and reared upon a vegetable and milk diet, without ever being permitted to taste of flesh, becomes remarkably gentle, and manifests none of that ferociousness, which is common to its species;—but if

afterward it be fed on flesh it soon becomes ferocious, and cruel, and destructive. The same demonstration, as we have seen, (§ 849.) is afforded by feeding herbivorous animals on animal food. "In Norway, as well as in some parts of Hadramant and the Coromandel coasts," says Bishop Heber, "the cattle are fed upon the refuse of fish, which fattens them rapidly, but serves at the same time totally to change their nature and render them unmanageably ferocious." And it is an interesting fact, that the sacred scriptures fully confirm this doctrine. The prophet Isaiah, foretelling the coming of the gospel kingdom, and figuratively describing that reign of righteousness and peace when all the rancorous and ferocious passions of man, shall give place to placableness and gentleness and meekness and benevolence and charity, when the bear and the calf—the leopard and the kid—the lion and the lamb, and all other ferocious and gentle animals shall associate, and dwell, and lie down together in peace, says, "*The lion shall eat straw like an ox.*" Now whatever interpretation any one may see fit to give to this passage in other respects, it is not possible there should be two opinions concerning the point under contemplation. Whether it be said that the prophet literally means that the lion and the lamb shall dwell together in peace and the lion shall eat straw like an ox, or that, by this language he intended to teach figuratively what shall take place in the human family, it remains equally true and equally evident that he designed expressly and clearly to teach the important relation between the natural temper and moral character, and the nature of the diet of the animal or individual. I cannot conceive that any one can be so blind or so perverse as not to see at a glance, that the prophet intended in a prominent manner, to associate the wonderful gentleness of the lion with his vegetable

food, and thereby, clearly to teach the relation between the carnivorous character of the lion and his natural ferociousness, and between his remarkable gentleness in the new state of things, and his vegetable aliment. If therefore, the prophet had explicitly affirmed, in so many words, that flesh-meat tends more to develop and strengthen the selfish and contentious, and cruel, and ferocious passions, than pure vegetable food does, he would not have taught the doctrine more clearly than he has done in the passage before us.

§ 1240. I do not however affirm that, those who subsist exclusively on vegetables and water, will never exhibit any unamiable passions.—To use the language of phrenology, combativeness, and destructiveness, and acquisitiveness, &c. are essential elements in the constitutional nature of man, originally designed for good and adapted to good; and no kind of aliment can ever obliterate them: nor is it desirable that they should be obliterated;—but rather that they should be properly subordinate to the intellectual and moral powers, and strictly maintain their functional integrity with reference to their final causes. It must necessarily always be true therefore, in the present state of being, that man will be naturally capable of anger and other violent passions. And a thousand other causes besides flesh-eating, and the use of intoxicating substances, are continually operating in civic life, to excite unlovely and injurious passions in man:—and for that very reason, flesh-eating is a far more powerful cause of these effects, in civilized than in savage life. The Patagonian may subsist wholly on flesh, with his other habits and circumstances of life, and be tolerably gentle and peaceable; but bring him under the ten thousand exciting and irritating and debilitating mental and moral and physical causes of

civic life, and he would soon find that his exclusively flesh diet was a powerful source of evil to him. (§ 1238.)

§ 1241. Vegetable-eaters certainly may, and often do become vicious, under certain circumstances:—but as a general fact, their vices are of a different character from those of flesh-eaters under similar circumstances;—they are less violent—less ferocious and blood-thirsty. The Hindoos, with their great excesses in opium, arrack and other intoxicating and stimulating substances, and situated amidst many circumstances unfavorable to industry and virtue, (§ 1031.) are often given to low and degrading vices,—such as deceit, lying, fraud, theft, &c. But when we consider how densely they are crowded together,—how indigent and how idle thousands of them are, and how universally they are accustomed to excess in various stimulants, we have reason to be surprised that so little of violence and bloodshed should be perpetrated among them. The lazzaroni of Naples present a similar general fact.—Fortunately for the cause of humanity, those tribes of the human race, who subsist wholly or principally on flesh, cannot be prolific, (§ 1120.) and therefore, their population never becomes dense like that of India:—nor can they procure the means of habitual and free indulgence in the use of intoxicating substances.

§ 1242. On the whole then, the comparative effects of animal and vegetable food in relation to the propensities and passions in the human species, are these. Flesh-meat is more stimulating, more heating than vegetable food, and its immediate effect on those who eat it, is to increase the energy of the more exclusively selfish propensities and the violence of the more turbulent, ferocious and mischievous passions. Its permanent effects, from generation to generation as a general fact, are to increase the relative proportion of the lower and back part of the brain,

and to cause the animal, to predominate over the intellectual and moral man: and when the numerous exciting, irritating, debilitating and depraving causes which abound in civic life, co-operate with this, their combined efficiency of evil is tremendous. And surely, it is of less importance to us, to know how far the savage in all the rude simplicity of his habits and his circumstances, may be able to endure the effects of an exclusively flesh diet, than to know what are the effects of flesh-meat on man in civic life.

§ 1243. We have seen, (§ 1123. &c.) that in all conditions of life and in all circumstances, a well-chosen vegetable diet is better adapted to the organization and physiological properties, powers, laws and interests, of the human body than flesh-meat;—yet that, in some conditions and circumstances man can subsist on flesh-meat, with less disadvantage than in others.—But the fact that the Esquimaux and Patagonian in their conditions and circumstances, can subsist on flesh with less disadvantage than the Hindoos could in theirs, should not lead us to conclude that flesh is better for the Esquimaux and the Patagonian in their conditions and circumstances than vegetable food, nor that it is as good.

§ 1244. If now we recur to the explanation which I have given of the moral powers of man, or rather of the moral sense and conscience, (§ 603. *et seq.*) and apply the principles there laid down, to the reasonings before us, we shall find that flesh-meat, by augmenting the carnal influences on the intellectual and moral powers, (§ 617.) always increases the tendency of our understanding to misapprehend, and inaccurately weigh the evidences presented to it, (§ 630.) and to arrive at erroneous conclusions on all questions of right and wrong, (§ 631.) and more especially when self is in the slightest degree inter-

ested: and consequently, it always increases our tendency to form an erroneous conscience. (§ 633.) And also, if phrenology be true, in regard to the organs of benevolence and veneration and hope and marvellousness, (§ 546.) flesh-meat always tends to impair the functional integrity of those organs, and increases our tendency to misapply our benevolence,—to exercise our veneration superstitiously on unworthy objects, even the basest idols,—to cherish delusive and debasing hopes, and to give ourselves up to a superstitious faith and fanatical credulity.—The moral sense tells us to be right; but the understanding only can determine what is right. (§ 622.) — Hope prompts us to hope, but the understanding only can determine what to hope for. (§ 639.) — Veneration prompts us to reverence, but the understanding only can determine what we should venerate.—Marvellousness prompts us to exercise faith, but the understanding alone can determine what we may properly believe.—Thus, all the sentiments as simple elements in our moral constitution, merely prompt us to be cautious, to be right, to hope, to venerate, to believe, &c., but depend entirely on the understanding to determine what is true in regard to their simple dictates or promptings.

§ 1245. But the understanding can only determine what is true, by examining and weighing evidences presented or apprehended:—and false evidences may be presented, or but part of the evidence in the case may be examined, or the evidence may be inaccurately weighed; (§ 629.) yet, if, by any means, the understanding is fully brought to erroneous conclusions under the promptings of the moral sense, veneration, hope, &c., an erroneous conscience, a false reverence, a false hope, &c. necessarily result. Now flesh-meat comes in, to diminish the sensorial power of the nervous system (§ 1135.) and

thus, to impair the pure, healthy energy and activity of the sentiments, and the delicate power of the understanding to perceive moral and religious truth: (§ 633.) then, it increases the relative power of the animal propensities (§ 1239.) or the carnal influences on the operations of the understanding, (§ 630.) deceitfully seducing it to neglect or misapprehend, or inaccurately weigh evidences, and thus bringing it to erroneous conclusions: and finally, as a general and permanent fact, it tends to diminish the relative size of the upper and front parts of the brain, and thus to cause the animal, to predominate over the intellectual and moral man. (1228.)

§ 1246. Thus, after having carefully and minutely examined all the anatomical and all the physiological evidence in relation to the natural dietetic character of man, we perceive that there is not the slightest reason for considering man an omnivorous animal: but that every jot and tittle, both of anatomical and physiological, and, I may add, of psychological evidence relevant to the question, go to prove most clearly and conclusively, that **MAN IS NATURALLY A FRUGIVOROUS AND GRANIVOROUS, OR A FRUIT AND VEGETABLE-EATING ANIMAL.**

§ 1247. But I shall again be asked:—What will you do with the grand fact that, a considerable portion of the human family have, for at least thousands of years, subsisted on a mixed diet of vegetable and animal food?

§ 1248. I reply that God has created man with a constitutional adaptation to vegetable food;—so that, a pure and proper vegetable diet is essential to the highest and best condition of human nature: but God has also created man with a constitutional *capability* of adapting himself—within certain limits, to that which is not compatible with the highest and best condition of human nature; but which, as it is more or less of an infraction of the

laws of constitution and relation established in his system, will sustain the physiological and psychological interests of his nature with more or less disadvantage and deterioration. (§ 735.)

§ 1249. This point may be illustrated by a most complete analogy.—Man was originally created with a constitutional adaptation to some particular climate: so that, there is, or has been, somewhere on the face of the earth, a particular climate which is perfectly adapted to the highest and best condition of human nature in every respect; and every departure from this, is necessarily attended with some disadvantage to the physiological interests of man's nature:—yet we find that mankind have actually spread themselves out over the whole globe, and acclimated themselves to every portion of the earth's surface: and from this grand fact we learn,—not that man is created with a constitutional adaptation to every climate over the whole face of the globe:—nor that one man is created with a constitutional adaptation to one climate, and another to another: but that man is created with a *constitutional capability* of adapting himself to a very great variety of climates. Nevertheless, it remains strictly true that there is a particular climate which, of all others, is best adapted to the highest and best condition of human nature: and man possesses no such constitutional capabilities of adaptation, as will enable him to adapt any other climate to the highest and best interests of his nature; nor to adapt himself to any other climate in such a manner as to secure the highest and best interests of his nature: but in all cases, he necessarily makes some sacrifice of those interests, by every departure from that particular climate, to which man, as a species, is constitutionally adapted. (§ 773.) True, if he goes into a cold climate, he can regulate the temperature of his

body by clothing and other means;—yet the very means by which he thus artificially regulates the temperature of his body, are, necessarily, in all cases, to a greater or less degree, injurious to the physiological interests of his nature:—and still, with all these disadvantages, he may maintain life and health perhaps for a hundred years and more. But does this last fact prove that the climate in which he lives, is in the highest degree favorable to human health and longevity? Most certainly it does not. (§ 882.)

§ 1250. This reasoning is all strictly applicable to the dietetic character and capabilities of man. The grand fact that considerable numbers of the human family, have long subsisted on a great variety of vegetable and animal substances, proves—not that man is created with a constitutional adaptation to all the vegetable and animal substances from which the human body has physiological power to elaborate any nourishment: (§ 694.)—nor that one man is created with a constitutional adaptation to one kind of aliment and another man to another kind:—but that, man is created with a constitutional capability of adapting himself to a great variety of aliment. So that, if necessity requires it—in case of shipwreck or any other emergency, he can sustain life for a while, on almost any vegetable or animal substance in nature. Still it is none the less true that there are particular kinds of food, which, of all others, are most conducive to the highest and best condition of human nature, in every climate and in all circumstances. Nor does man possess any such constitutional capabilities of adaptation, as will enable him to adapt any other kinds of food to the highest and best interest of his nature;—nor to adapt himself to any other kinds of food, in such a manner as to secure the highest and best interests of his nature: (§ 773.) but

in all cases, he necessarily makes some sacrifice of those interests by every departure from those particular kinds of food to which man as a species is constitutionally adapted. (§ 735.)—He may, it is true, by the exercise of his intellectual and voluntary powers, artificially prepare many substances, to which he is not constitutionally adapted, in such a manner as to render them more palatable and perhaps less pernicious to him; but he can never make them in the highest degree salutary to the physiological and psychological interests of his nature;—while the very artificial means which he employs in preparing those substances, are, in all cases, to a greater or less extent, sources of evil to him; (§ 418.) and though he may maintain life and health in this way for seventy or a hundred years, yet it by no means proves that his mode of living is most favorable to human health and longevity.

§ 1251. Is it said that I make a distinction where there is no difference, when I speak of constitutional adaptation, and constitutional capability of adaptation?—I reply that the difference is obvious and essential.—Man is constitutionally adapted to water or the aqueous juices of fruits as a drink; and pure water is therefore, in the highest degree favorable to the physiological and psychological interest of man in all climates and in all circumstances, when drink is required: but he is not constitutionally adapted to ardent spirit as a drink: nor has he the capability of adapting ardent spirit as a drink to the physiological and psychological interests of his nature:—yet he has the constitutional capability of adapting himself to ardent spirit as a drink,—but not in such a manner as to secure in the highest degree, the physiological and psychological interests of his system (§ 773.)—on the contrary, he does great injury to those interests by

such an adaptation, and in all cases, necessarily sacrifices those interests to a greater or less extent, by every departure from pure water as a drink. (§ 735.) Nevertheless, extensive experience has fully demonstrated that man can so adapt himself to tea, coffee, cider, beer, wine, ardent spirit and other kinds of alcoholic and narcotic beverages, as to be able to use them habitually, and yet to maintain a degree of health, in some rare instances, for fifty, sixty, seventy years, and more.—Yet he always does it to the injury of the physiological and psychological interests of his nature, and at the risk of his life; and knows not at what moment his habits may precipitate him to destruction.—All this is true in regard to food:—and therefore, the fact that man is capable of adapting himself to any particular kind of aliment and of habitually subsisting on it, by no means proves that that kind of aliment is adapted to the highest and best condition of human nature, nor even that it is best adapted to the particular condition and circumstances in which he may individually be placed.—I repeat then, in the conclusion of this general topic, what I have frequently before stated, that nothing is more erroneous than our reasonings from experience on subjects of this kind may easily, and almost inevitably will be, if our investigations are not governed by the most rigidly accurate principles of physiological science.

LECTURE XX.

Experience in favor of a mixed diet, does not militate against the physiological principles advanced in these lectures—Health may be maintained at the expense of life—Intensive and extensive life incompatible—Health not a proof of good habits—Case given—Healthiness of butchers—Ruddiness, how far an evidence of health—Brief recapitulation of the effects of animal food—What, on the whole, is best for civilized man in regard to flesh-meat—The necessity for flesh-meat in childhood—Scrofulous diseases in connexion with vegetable diet—if people will eat flesh, the best kind and manner—The Mosaic regulations physiologically correct—The flesh of clean animals in a state of nature best—Fatted animals diseased—Blood should not be eaten—why?—Fat should not be eaten—why?—Beaumont's experiment in regard to fat—The muscular fibre of clean healthy animals, the best part of the body—Birds, what kinds best—Fishes, what kind best—Preparations of animal food—Best raw—Best modes of cooking it—Liquid forms of food objectionable—Salted flesh and fish not good—smoked still worse—Butter better avoided—if any used, what, and how?—Butter bad for invalids—Cheese better avoided—the best and most wholesome kind—Milk, general opinion and experience concerning it—Anatomical and physiological principles concerned.—General conclusion concerning milk—Important that it should be from healthy cows fed on clean healthy food—Cream, if sweet and good, better than butter—Eggs, how best used if used at all—Flesh impairs the power of the stomach to digest vegetables and fruits—Concluding remarks in regard to animal food.

§ 1252. WE have seen (§ 708.—807.) that, whatever be the diet on which man subsists, simple, plain, coarse, natural food is most perfectly adapted to the laws of constitution and relation established in his nature;—the

most conducive to the health, vigor, and long life of the body, and most favorable to the energy and activity of the intellectual and moral faculties.—We have seen also, (§ 808.—1251.) that, all the anatomical and physiological evidence which the human system affords in relation to the subject, fully and conclusively proves that man is naturally a frugivorous and granivorous—or a fruit and vegetable-eating animal.

§ 1253. But the experience of a considerable portion of the human family for several thousand years, has also proved that, man *can* subsist on a mixed diet of animal and vegetable food, and in many instances enjoy good health, and possess great bodily and mental vigor, and attain to what is ordinarily considered very old age.

§ 1254. This fact however, does not, in any degree, militate against the general conclusion established by anatomical and physiological evidence:—for, it should ever be remembered as one of the most important and invariable laws of our nature, that, *we may maintain health at the expense of life*.—Or, as Professor Hufeland expresses it, (§ 1115.)—“very sound health may shorten life.”—Or, to state the proposition with more exactness and accuracy,—we may, by virtue of a sound and vigorous constitution, and by the help of many circumstances and habits favorable to health, strength, and longevity, maintain comparative health and vigor, until we attain to what, in modern times, is ordinarily considered old age, in spite of some circumstances and habits which are unfriendly to the highest physiological interests of our bodies, and which necessarily hasten the consumption of life; and consequently, shorten the period of our human existence. For as I have stated, (§ 1109.) nothing is more true than that, *intensive* and *extensive* life are incompatible with each other, and it is universally admitted that flesh-

meat always causes more vital intensiveness than pure and proper vegetable food does. (§ 919.) High-toned and vigorous health therefore, is not a conclusive proof that our dietetic habits are most favorable to health; nor is the long continuation of such health, a proof that our dietetic habits are most conducive to longevity. The truth of this important proposition is often strikingly demonstrated, by individual experience. I will present a single illustration.

§ 1255. At the close of my introductory lecture, in one of the beautiful villages of New England, I was addressed by a professional gentleman, of very considerable intelligence, who was not far from seventy years of age,—of portly appearance and seemingly in what is commonly considered, good health. He had a large frame, well clothed with flesh, and a somewhat florid complexion. Yet he was strictly temperate in regard to alcoholic liquors.—“I am glad to see you,” said he, “and rejoice that you have consented to come and give a course of your lectures to our people:—I think there is great need of such instructions at the present day.—In our land of overflowing abundance, every body is in danger of excess; and I lament to see our young people so much devoted to the indulgences of luxury.—I shall certainly attend your lectures, and doubt not that I shall listen to them with great interest, although I do not expect to be benefited by them in my own person. I am now too far advanced in life to make any changes in my habits, with the hope of being benefited,—even though some of my practices might be considered a little exceptionable. Yet I have, by no means, been inattentive to these things; and I think I have the best evidence in the world, that my habits have been very salutary;—for I am now an old man, in the enjoyment of uncommon health and vigor for one

of my age;—and during my whole life, since my remembrance, I have not been so much indisposed as to be obliged to keep my house for a single day!”—Indeed sir! I replied, that may be very greatly your misfortune.—“Misfortune!” he reiterated with much emphasis and surprise—“How can it be a misfortune to enjoy uninterrupted health for seventy years?”—Because sir, I answered, judging from the original soundness and vigor of your constitution, you are now but little past the meridian of your natural life; and the continued health of which you boast, may only have served to blind you to your dietetic and other errors relative to the laws of life, and to give you full confidence in the correctness of those habits, which may in the end, prove to have robbed you of nearly half of your natural existence.—It should be remembered that not one human being in a million dies a natural death.—If a man is shot, or stabbed or poisoned or killed by a fall, or some other means of this kind, we say he dies a violent death;—but if he is taken sick and is laid upon his bed, and is attended by physicians and friends, and waxes worse and worse and finally dies, perhaps with dreadful agonies and anguish, we say he dies a natural death.—But this is wholly an abuse of language,—a misstatement of fact;—the death in this latter case is as truly a violent death, as if the individual had been shot, or stabbed or poisoned. Whether a man takes a dose of arsenic and kills himself at once, or takes small doses which more gradually and by more imperceptible degrees destroy his life, he equally dies a violent death,—though the convulsive agonies, which attend his dissolution, may be less violent in the latter than in the former case. (§ 1106.) And whether he gradually destroys his life with arsenic, or any other means however common, he equally dies a violent death.

—He only dies a natural death, who, during his whole existence, so perfectly obeys the laws of constitution and relation established in his nature, as neither by irritation nor intensity to waste his vital energies, but naturally and slowly passes through the progressive changes of his system, from childhood to old age, and finally, in the sheer exhaustion of his vital powers, lies down and falls asleep in death, without a struggle or a groan.

§ 1256. The worthy gentleman, if not entirely convinced, was at least made thoughtful by my remarks: and so we parted.—At my next lecture I observed he was not present.—The third and fourth were given, and he still was absent. This excited my curiosity to make inquiries after him,—and I was surprised to learn that he was very ill.—A few days more elapsed, and I was informed that his physician considered him dangerously sick:—that his disease had thus far baffled the physician's skill; and his symptoms had from the first continued to become more and more violent, in spite of all the means which had been used to subdue them. I now called to see him and was exceedingly astonished to behold how great a change had taken place in his appearance in so short a time.—A few days after this, he died.—I however, visited him frequently before his death:—and at each interview, scarcely had I entered his room before he began to exhort me with much earnestness and pathos, to be faithful in my public labors, to warn the rising generation of the dangers of the table, and to entreat parents not to destroy their children, by multiplying and pampering their appetites in early life, till they had become such perfect slaves to them, as not to be able to deny themselves; but were led captive by their lusts to their destruction. Before he died, he requested that his body might be

opened and examined after his demise.—I was politely invited to attend this post mortem examination.—And though I have seen many diseased bodies opened after death, yet never, in any instance, have I found disease so extensive as in this case. The entire stomach and intestinal canal and other portions of the abdominal contents, presented one general mass of deep and irremediable disease, which clearly indicated a progress of several years; and which was of a character that fully evinced that it was not produced by any sudden or violent cause; but that it was the result of causes which had been gradually operating, and by imperceptible degrees developing their effects, probably through the whole course of life.

§ 1257. This individual was a pious, and I doubt not, a good man.—His habits, in all respects, had been such as good people in modern times consider strictly consistent with christian principles:—and there was no one thing, nor practice, nor circumstance, which could be fixed on as the specific cause of his disease.—He loved, indeed, the good things of the table, and enjoyed the social repast;—but always, as he believed, within the bounds of christian propriety; and was probably never more excessive than is extremely common for good men.—The cause of his untimely death was therefore, no particular outrage or violence done to his system; but the habitual oppression and over-working and consequent irritation of his organs, which a vigorous constitution had sustained for a remarkably long time:—and by that depravity of his physiological powers which I have pointed out; (§ 739.)—his system was unable to manifest those symptoms of the early stages of the disease in his organs, which would have enabled him to take timely measures to remove it, and therefore it pro-

ceeded to the destruction of his life, without being even suspected by himself or his physician. For, before his body was opened, no one had the least expectation of such a disclosure as was made.

§ 1258. This single case then, fully demonstrates for the whole human family, the important proposition, that present health is not a conclusive proof, that the dietetic and other habits of the individual are most favorable to health, nor does the continuance of health, prove that those habits are most conducive to long life.

§ 1259. Butchers are often referred to as evincing the healthy and invigorating effect of a free use of flesh-meat. But I apprehend that there is a very general error of opinion on this point. I have taken great pains to investigate this subject, and have made my inquiries very extensively among this class of men, in several of our principal cities. From the concurrent testimony of all intelligent butchers with whom I have spoken on the subject, I learn, 1. that as a general fact, there is far less flesh-meat consumed by butchers than is commonly supposed. Indeed they all assure me that as a class, they do not consume more of this kind of aliment than other members of society; and many of them eat less of it: 2. that butchers are more particular in regard to the kind and quality of their flesh-meat, than other people,—or to use their own language, they “eat none but the best:” 3. that there is much more indisposition and sickness among butchers than is acknowledged by those who write in favor of animal food; and that where there is a free use of flesh-meat, the diseases are generally violent, and are apt to terminate fatally: 4. that those who indulge freely in flesh-meat rarely attain to old age: and, 5. that the healthy and robust appearance of butchers is more attri-

butable to their regular habits and active employment in the open air, than to their animal food.

§ 1260. There is another thing concerning which, a general error of opinion prevails. It is a common notion that a florid countenance, when not produced by intoxicating liquors, is a sure sign of good health, and that a pale complexion is an invariable indication of poor health.—It is true that there is a kind of sallow, sickly paleness which is a pretty sure sign that the functions of the system are not all healthfully performed; but it is far from being true that a ruddy countenance is always the index of good health;—and still farther from being true that it is always the index of that health which is most compatible with long life. “Too much ruddiness in youth,” says Hufeland, “is seldom a sign of longevity.” As a general fact, at all periods of life, it indicates that state of the system in which, either from disease or from intensity, the vital expenditure is too rapid for permanent health, and for longevity. The clear complexion in which the red and white are so delicately blended as to produce a soft flesh-color, varying from a deeper to a paler hue according as the individual is more or less accustomed to active exercise in the open air, or to confinement and sedentary and studious habits, is by far the best index of that kind of health and of that temperament which are most favorable to continued health, and length of days.

§ 1261. As a general law of the human constitution then, (to which particular individuals may form temporary exceptions,) flesh-meat, in any quantity, is not necessary nor best for man, in any situation; while excessive flesh-eating deteriorates his nature in every respect. It impairs the symmetry of his body and the beauty of his person,—renders him less supple and active and less

able to endure severe and protracted effort and fatigue and exposure and privation,—impairs his complexion,—causes his breath to be fetid, and his body more liable to disease and less able to recover from it,—abbreviates the period of his earthly existence,—renders him less able to endure heat and cold,—and as a species less prolific,—diminishes the sensorial power of his nervous system, and consequently, the functional power of his organs of special sense, and of his intellectual and moral faculties,—increases the energy and violence of his more exclusively selfish propensities and passions, and renders him more dull, stupid, sluggish and sensual.—Nevertheless experience has proved that the dietetic use of flesh, is, to a certain extent which is regulated by circumstances, compatible with present health and strength,—and where certain circumstances are favorable to longevity, admits of what is ordinarily considered, old age. (§ 925.)

§ 1262. But while all this is true of the healthy and vigorous body, accustomed to much active exercise in the open air, it should ever be remembered that in civic life, as a general rule,* the diseased—the invalid—the delicate cannot with the same safety suffer flesh in any quantity nor in any form to enter into their diet. (§ 1105.) It has been well observed by the distinguished Dr. Cheyne, of whom I have before spoken, (§ 1104.) that although they who are laboring under chronic diseases of certain kinds, may, by a strict and careful regimen, which admits of a small portion of flesh-meat in their diet, very considerably mitigate their symptoms, and perhaps for many years, continue in a tolerably comfortable state, as

* There may be particular cases of disease in which, individuals who have always been accustomed to flesh-meat, may find it necessary to continue the use of this kind of food for a short time, on the same principle that they use medicine, (§ 1104.)

invalids, yet they cannot hope entirely to eradicate their disease and recover their original health, without a total abandonment of animal food.—It has also been judiciously observed by another celebrated writer on health,—that, when all the circumstances of civic life are taken into consideration, citizens generally should be regarded as invalids, by those who lay down rules of diet and general regimen for them:—for although they may not be actually diseased, yet the causes which continually conspire to make them so, are so numerous and so powerful, that they need to use the caution and the prudence of invalids in order to preserve the health which they possess. Let it be understood however, that the caution and prudence here suggested, do not mean that citizens should be always taking medicine; or trembling lest a free breath of air should blow upon them,—nor always thinking about their health,—but that they should carefully avoid those excesses and errors in their dietetic and other habits, which are decidedly unfavorable to human health, and which none but the robust, active laborer in the open air, can long endure without disease, and even he, never with impunity.

§ 1263. But, whatever claims may be urged on the score of habit, for the necessity of flesh-meat, by those who have been long accustomed to the use of animal food, certain it is that no such claim can be set up in regard to the diet of children:—and it is equally certain that, as a general and permanent law of the human constitution, affecting, not only the individual, but the species from generation to generation, through all time, a pure and well-chosen vegetable diet, under a correct general regimen, is in every respect, most favorable to the physiological and psychological interests of man; and therefore, it is the most suitable nourishment for children, and is best

adapted to develop and sustain their bodies, in all their physical and vital and intellectual and moral powers.

§ 1264. I am fully aware that the opinion has been frequently advanced and is perhaps generally entertained by medical gentlemen and others in England, Scotland and America, that the total absence of animal food in the diet of children, leads to scrofulous and other cachectic diseases; and that the best remedy for these diseases, is a generous diet consisting mostly of flesh-meat:—and the fact that in Scotland and other countries where the food of children is principally vegetable, these diseases greatly abound, has been repeatedly urged in proof of the correctness of the opinion. But I am none the less confident that the opinion is entirely erroneous; and that it has arisen from a total misapprehension and misinterpretation of facts. In our own country, where animal food is almost universally consumed in great excess, and where children are trained to the use of it, even before they are weaned, scrofulous affections are exceedingly common, and lead to that fearful prevalence of pulmonary consumption, which has rendered that complaint emphatically the *American Disease*.

§ 1265. That a crude, watery diet, of ill-prepared vegetable food, in connexion with an improper general regimen, may lead to an unhealthy state of the solids and fluids of the body, in childhood, is unquestionably true: but an accurate and thorough investigation of the subject, will show that filthiness, impure air, and other unwholesome circumstances and errors of regimen, are infinitely more concerned in producing scrofulous diseases in the children of Europe, than the want of animal food. To say nothing of the well-fed vegetable-eating children of other countries in all periods of time,—the private and public experiments which have been made in the United States

within the last ten years, have fully demonstrated, not only that the very best health can be preserved in childhood without the use of flesh-meat, but that feeble and cachectic children, and even those who are born with a scrofulous diathesis, can be brought into vigorous health on a well ordered vegetable diet, under a correct general regimen.—The extensive experiment which has been made in the Albany Orphan Asylum, since the close of 1829, has afforded results so conclusively in favor of a pure vegetable diet for children, that they ought to command the serious attention of every philanthropist, of every parent and of every one who may come under the responsibilities of a parent.*

§ 1266. I say then, to every one and to all, as Moses said to the Israelites in the wilderness concerning their future habits in the promised Land,—if notwithstanding all that I have said against the use of flesh-meat, ye still say—“*We will eat flesh because our souls long to eat flesh,—then eat ye whatsoever your souls lust after:*” only permit me to point out to you with utmost brevity, the least objectionable kinds and modes of such transgression.

§ 1267. It is true, as the scriptures affirm and as I have before remarked, (§ 694.) that the human body is capable of deriving nourishment from “every living thing that moveth” in the animal kingdom—reptiles and vermin, as well as four-footed beasts, and fowls of the air and fish of the sea: and among the different portions of the human family, animals of nearly every known species belonging to our globe are devoured as food. But it is nevertheless true that some kinds of animals are less objectionable for human aliment than others, and

* See a full account of this interesting Institution in the Appendix of this Volume, Note A.

some portions of the animal body may enter into the diet of man with less injury to his physiological interests as an individual and as a species, than other portions.

§ 1268. It is perhaps the prevailing opinion that the dietetic regulations of the Jews, instituted at mount Sinai, constitute a special regimen adapted to the particular condition and circumstances of that people, and to the peculiar economy of the Mosaic dispensation: and it is undoubtedly true that, in some respects, those regulations were more immediately necessary to the preservation of individual health among the Jews, in their particular climate, condition and circumstances, than they are to people who, in these respects, are very different. Still, however, it is an interesting and important truth that the dietetic regulations of Moses are founded on the physiological laws of the human constitution, and therefore, are universally applicable and always valid: for although, as a general fact, a disregard to those regulations would not produce the same morbid results in the transgressor in Arabia and in Lapland, yet in all cases and in every place, if animal food is used, a strict conformity to those regulations, would be better for man as an individual and as a species.

§ 1269. If it be said that the dietetic regulations of Moses tolerate the use of flesh-meat, my reply is that I shall show in another work, that Moses permitted the Jews to eat flesh on the same principle that he suffered them to put away their wives, and that the whole economy of the Mosaic dispensation, aimed rather to restrict than to encourage the Jews in the use of this kind of food: and that his dietetic regulations concerning it, were obviously designed to restrain them as much as possible, and confine them to the least objectionable kinds and preparations.

§ 1270. It is not necessary for me to specify the kinds of animals to which Moses limited the Jews. Every one who is curious on this subject, can easily refer to the Old Testament. It is sufficient for me to state in general terms, that they consist of those species whose natural food is the most pure, mild and unexciting, and whose flesh, when used as human aliment, is least stimulating in its nature, and least febrile and putrescent in its tendency. And of these animals none but the perfectly healthy and those that were properly killed,* were allowed to be eaten.—It is also an exceedingly important and interesting fact, to flesh-eaters, that in those days, when tillage was less artificial, and when flocks and herds grazed more at large, and subsisted more upon the spontaneous produce of the uncultivated soil, than in modern times, the flesh of the ox and sheep and other domesticated animals, was far less unwholesome than the flesh of the same species of animals, fed and fattened on the produce of an exceedingly depraved, and,—if I may so speak—morbidly excited soil which has long been subject to the forcing and depraving processes of modern agriculture. Moreover, the confinement, and stall-feeding, and all the other artificial circumstances and educated habits of domesticated animals, render their flesh less wholesome for human aliment. Indeed, as I have already remarked, (§ 511.) most of the animals which in modern times are fitted for the slaughter-house and for interment in living

* The animal is not stunned with blows, producing stagnation and congestion of the blood; the throat is cut with a remarkably sharp knife, and all the veins and arteries are emptied; the lungs are searched with the hand; if the liver attaches to the ribs, or there are impurities, malformation or any apparent disease, it is condemned, and the leaden seals are not attached to the meat. It is thus, that the observance of ancient laws by this ancient people, gives them great protection against feeding on diseased animals.—*N. Y. Eve. Star, Nov. 1833.*—*M. M. Noah.*

sepulchres, are actually in a state of disease when they are killed: and therefore, shocking as the thought may be, the human stomach in these days of elegant refinement, and of science and religion, is actually made a kind of “potter’s field” to receive the unknown dead of every disease! Why should we marvel then, that putrid and malignant, and violent diseases, as well as those of a more chronic character, and less alarming symptoms, but more general prevalence, should so severely scourge the human family,—and especially in civic life!

§ 1271. As a general rule therefore, the flesh of wild animals regarded as clean by the Mosaic regulations, and of the ox and sheep and other domesticated animals when suffered to roam at large in the pure air of the field, and to select their food from the produce of the natural or virgin soil, according to the undepraved instincts of their nature, is far less unwholesome, than the flesh of those animals which are reared and fattened on the produce of a cultivated soil and in the customary manner of modern times.—The very process of fattening I have said, (§ 511.) and I repeat it solemnly—the very process of fattening—and most especially in the artificial mode of stall-feeding—is a diseasing process, and the large accumulation of adipose or fatty matter in the body, is always, in some measure a morbid result of the unbalanced functions of the system.

§ 1272. The Mosaic regulations most strictly prohibited the use of blood as human aliment. This prohibition is founded on important moral, as well as physiological principles.—The sacredness of life in all cases, except when its destruction is necessary for the good of man or other animals, was more highly appreciated by the wise moralists and lawgivers of antiquity than by the christian philosophers of modern times. The Mosaic

prohibition recognises the great moral truth that the wanton destruction of life in the lower animals, not only deadens the moral sensibilities and sympathies of man, but greatly diminishes, in his estimation, the sacredness of human life.—Nothing is more true than that familiarity with blood always hardens man and makes him more wantonly cruel. And when man not only sheds, but also devours blood, he is both morally and physiologically affected by it:—his moral sensibilities and sympathies are deadened and his selfish and destructive propensities are increased and rendered more vehement and ferocious. (§ 1222.)—Blood is oppressive to the human stomach, and digested by it with difficulty, and always produces a general increased excitement in the system, and tends to febrile and putrid diseases. It putrefies much sooner than the animal solids: and when animals are strangled or put to death in any manner by which the blood is retained in their bodies, it causes an earlier and more rapid change and putrid decomposition in the solids, rendering them far less wholesome for human nourishment. It is also an important fact, that when animals have eaten or inhaled any poisonous substance, and it has been taken up by the absorbents, (§ 458.) the state of the blood is more immediately and extensively affected by it than that of the solids: and when by any means, the animal becomes either locally or generally diseased, the blood and other fluids of the system are much sooner brought into that morbid state which will produce disease in the consumer, than the solids. Hence thousands of cattle are slaughtered in a state of disease and their flesh is eaten without producing any immediate symptoms of disease in the consumers: but if those same cattle were strangled, and their flesh eaten with the blood in it, or the blood eaten

alone, it would almost inevitably produce immediate disease in the consumers.

§ 1273. Another exceedingly important dietetic regulation in the institutions of Moses was the prohibition of fat. He proclaimed it as "a perpetual statute for their generations, throughout all their dwellings, that they should eat no manner of fat,—of ox nor of sheep nor of goat nor of any other beast." And this is not merely a special statute adapted to particular situations and circumstances, but it is a regulation founded on the permanent physiological laws established in the human constitution.

§ 1274. The adipose or fatty matter of animal bodies, we have seen, (§ 508.—511.) is a crude oily substance, resulting—when exceeding a small quantity in particular parts (§ 508.)—from excessive alimentation, or unbalanced action between the organs of composition and decomposition; (§ 509.) and is deposited in small sacs in the cellular tissue, till it can be removed by the absorbents and eliminated from the system. In the cells of this same tissue also, and closely associated with the adipose matter, other capillary exudations are often deposited; and among these, are some of a very morbid and even of a very deleterious character. Thus, when tobacco, alcohol and other poisons are taken into the system, there is, as we have seen, (§ 960.) at first, a general rallying of the vital forces, and energetic reaction till they are wholly expelled from the vital domain: but when these substances are habitually used till the organic sensibilities are depraved (§ 738.) and the integrity of the vital functions greatly impaired, the vital reaction is less energetic, and instead of an entire expulsion of the deleterious substances from the body, a portion of them is deposited in the cellular tissue with the adipose matter; where it often remains for months, and sometimes causes extensive bloating and

even general dropsy. I have known persons who had been greatly addicted to chewing, smoking or snuffing tobacco, and who, after an entire abstinence from it in every form, for several months, on coming from a vapor bath which had caused profuse perspiration, emit a powerful tobacco odor from their whole surface. Indeed I once saw a young person made sick at the stomach by rubbing the body of such an individual when he came from the bath.—The individual was a friend of mine whom I had taken to the bath on purpose to try the experiment, and he assured me that he had not used a particle of tobacco in any manner for four months. The keeper of the bath informed me that he had observed the same fact in many instances: and that some invalids who had boarded with him and been under his care, taking the bath three times a week, had continued to emit the tobacco odor, on coming from the bath, for several weeks in succession, when not a particle of tobacco had been used by the individuals for months. The same thing he had also observed in persons who had previously been much addicted to drinking alcoholic liquor, and others who had taken much medicine of certain kinds.

§ 1275. These facts, which may be relied on with entire confidence, clearly prove that the vital economy has some depository out of the general circulation, and at the greatest remove from the most important vital properties and functions of the system, where it disposes of those deleterious and other offensive and superabundant substances which, from any cause, it is unable wholly to eliminate from the vital domain: and this we have seen, (§ 509.) is none other than the adipose tissue. And hence, it is evident that when from poisonous or unwholesome food or from any other cause, morbid and deleterious deposits take place in the animal system, the general

receptacle is that portion of the cellular tissue which contains the adipose matter; and there is the strongest reason to believe that those substances become closely associated with the fat.

§ 1276. But whatever may be thought of this objection to animal fat as a portion of human aliment, there are other physiological reasons which show most determinately and conclusively, that it is not proper for the food of man. We have seen (§ 462.) that the assimilating organs of man digest this substance with great difficulty, and that they cannot digest it at all, except in very small quantities, without a departure from the perfectly regular and normal order of their functions:—and even by these means, they are never able to assimilate it so perfectly but that its crudeness is always manifested in the chyme, chyle, and blood, when it is freely eaten.—Dr. Beaumont, of whose interesting “experiments and observations on the gastric juice and the physiology of digestion” I have already spoken, (§ 431. Note) has fully settled this question.

§ 1277. Bile, it will be remembered, is secreted by the liver (§ 461.) and emptied into the duodenum (§ 338.) or small intestine, about four inches below the pyloric orifice of the stomach; (§ 341.) and naturally ought to descend along the intestinal tube (§ 462.) with other excrementitious substances, but it may, by a reverted action of the parts, be carried up and emptied into the stomach, and discharged by vomiting, as when emetics are taken—in paroxysms of sick-headache, &c.—As a general fact, whatever produces irritation in the stomach, has a tendency to cause the bile to be brought into the gastric cavity.—“Bile,” says Dr. Beaumont, “is seldom found in the stomach except under peculiar circumstances.—Irritation of the pyloric extremity of the stomach, and

external agitation by kneading with the hand, on the right side, over the region of the liver and pylorus, and also violent fits of anger, occasion a flow of bile into the gastric cavity: and I have observed that when the use of fat or oily food has been persevered in for some time, there is generally the presence of bile in the gastric fluids. Magendie expresses the belief that ‘in certain morbid conditions the bile is not introduced into the stomach;’ implying that in a healthy state it is always to be found there. But there can hardly be a greater mistake. With the exceptions that I have mentioned, *it is never found in the gastric cavity in a state of health*:—and it is only in certain morbid conditions that it is found there. When much fat meat or oily food has been used, the oil always maintains an ascendancy in the gastric cavity.—Bile is required and necessarily called into the stomach *only* for the purpose of facilitating the chymification of all fatty and oily aliments (§ 462.) and *its admixture with the gastric juice, seems to retard the digestion of all other than oily food.*”

§ 1278. It is therefore, fully ascertained by the experiments and observations of Dr. Beaumont, that in a perfectly healthy state of the stomach and equable frame of mind, *bile is never introduced into the gastric cavity, by the action of the parts*:—and its presence in the stomach may be regarded as an indication of morbid gastric irritation from mental or physical causes; and it may be considered a foreign and offending substance in that organ; retarding, or otherwise disturbing the function of digestion, in all cases except when oily substances are eaten; and then it is necessary in order to convert the oil into a kind of saponaceous substance, and thus prepare it for the action of the gastric fluid. (§ 462.)

§ 1279. By whatever means introduced then, bile is

always a cause of more or less irritation to the stomach, and through it, to the whole domain of organic life; and frequently, to the whole animal system; and particularly the brain:—hence, it is fully evident that as procuring causes of gastric irritation and aberration of function, fat meats and animal oils of every kind, tend to debilitate the digestive organs, and to induce in them a chronic morbid irritability;—and especially in civilized life where numerous other causes co-operate to produce the same result. Moreover, the great difficulty with which they are digested and the imperfectness with which they are assimilated in all the vital processes, (§ 462.) render them still further the causes of irritation and disease to the system. The particular character of the disease, which they cause, varies according to the peculiar predisposition and general circumstances and habits of individuals.—In some, it will take the form of dyspepsy,—in others, of liver complaint,—in others, of chronic diarrhoea,—in others, of pulmonary consumption,—in others, of sick-headache,—in others, of eruptions of the skin,—salt-rheum,—St. Anthony's fire,—erysipelas, &c.—in others leprosy, &c.—In very hot climates, the injurious effects of oily food are much sooner and more powerfully felt than in very cold climates; and hence, though it may be tolerated with *apparent* safety in the latter, it must be avoided in the former. Nevertheless, it is decidedly objectionable in all climates, situations and circumstances.

§ 1280. After what has been said concerning the dietetic regulations of Moses, (§ 1268.) and the use of animal fat as human aliment, (§ 1273.) it is hardly necessary to remark, that from every consideration, pork, or the flesh of swine is wholly unfit for the food of man, and will never be eaten by those who know and regard

the physiological laws which a wise and benevolent Creator has established in their constitution.

§ 1281. The muscular fibre, or lean meat of clean, healthy animals, which are allowed to run at large and feed according to their undpraved instincts, on the pure produce of the natural soil, is therefore, the most wholesome kind of flesh-meat—or the least unwholesome kind that can be employed for human nourishment.

§ 1282. What I have said in regard to the flesh of four-footed animals, is also true of the feathered tribes. Birds that subsist on flesh and fish, should never be eaten by man;—those which live on fruits and seeds and grass, are less objectionable. The wild are, generally speaking, less unwholesome than the domesticated, or tame.—Of the latter, the common farm-yard fowl and turkey, when kept on proper food, and not diseased in fattening, are decidedly less objectionable than geese and ducks. The flesh of these last, is too oily and too compact and hard, to be digested without much difficulty; and therefore, requires a vigor of the digestive organs, rarely possessed in civilized life, except by robust, active laboring men.

§ 1283. Concerning fish, the Mosaic regulations are strictly correct. Fresh scale-fish, recently taken from the ocean, or rivers of pure water, or from clear, running streams, or from lakes which are continually fed by living fountains, and have outlets by which they send forth their waters incessantly, are the only kinds of the inhabitants of the deep, which men who use animal food, should ever taste of, unless it be to prevent starvation, in cases of extreme necessity.

§ 1284. The flesh of such fish, is less exciting and also less nourishing than the flesh of the ox, and sheep, and other quadrupeds.—Those portions of the human family who subsist from generation to generation, prin-

cipally or almost entirely on fish, are, on an average, under the middle size, and often even dwarfish in stature, and generally, if not invariably, destitute of bodily symmetry.—But where a little dried or boiled fish is occasionally eaten, as a condiment, with bread or other kinds of vegetable food, its effects upon the human system can scarcely be appreciated:—and it is perhaps, no farther objectionable, than as it involves a general principle in relation to the use of animal food,—and is, so to speak—a stepping over the line of demarkation between the two kingdoms—and an opening of the way for unbounded excesses in carnivorous habits, in others, if not in ourselves.

§ 1285. In regard to shell-fish, notwithstanding clams, oysters and lobsters are such favorite articles of food with multitudes in civic life, and notwithstanding oysters have been so extensively recommended by physicians, to invalids and convalescent patients, it is nevertheless certain that the Mosaic prohibition of them is well founded; and that, they never should be eaten by mankind, except in extreme emergencies, when nothing less objectionable can be procured for food:—and most especially should they be avoided in civic life, where so many other causes are continually operating to impair the health and destroy the life of man.—I am aware of all that has been said in praise of their effects on invalids,—but those effects are generally, if not invariably specious and delusive, and do not deserve the credit which they have received.—When an individual of considerable constitutional power, experiences an attack of acute disease, and is suddenly reduced by remedial means, and kept for several days under the effect of medicine, with very little or no food till the disease is subdued and healthy action restored, the demand of the vital economy for alimentation is so

great, that there is as it were, a general rallying and concentration of the vital forces in the digestive organs, giving them a functional power far in advance of the general ability of the system, and enabling them to perform their assimilating function with uncommon energy and rapidity; and in many instances, to digest food with apparent ease which would occasion a fit of dyspepsy in the ordinary state of the stomach in civic life. This important fact, not being understood, has led to unbounded delusion in regard to the dietetic regimen of convalescent patients: and caused relapses and death in thousands of instances.

Preparation of Animal Food.

§ 1286. Revolting as it may sound to ears refined, and shocking as the idea may be to civilized human beings, still the stern truth of physiology compels me to declare that flesh, recently killed and eaten entirely raw, is least injurious to any animal that subsists upon it.—It is less rapid in its progress through the stomach, (§ 745.) less exhausting and debilitating to the digestive organs, less exciting to the system generally, and is more permanently sustaining to the physiological powers of the body, than when it has been subjected to the changes of culinary preparations.

§ 1287. I know that for a single meal or for a short time, a stomach unaccustomed to raw flesh, would not so comfortably dispose of it, as it would of that which had been previously prepared in a customary manner. Nevertheless, as a general fact, extending from generation to generation, it is strictly and incontrovertibly true that, if mankind eat flesh at all, they will better serve the physiological interests of their bodies, in every respect

—maintain more vigor of the organs, more integrity of their functions, secure more uniform, and sounder health and longer life, and a clearer, more active and powerful intellect, by eating it entirely raw, than by eating it after it has been prepared by cooking in any manner whatever.

§ 1288. But it may perhaps be said that the great naturalist Cuvier declares that, “neither the jaws nor the teeth of man will allow him to devour flesh unless it is previously prepared by cooking.” (§ 856.) I reply that Cuvier was incomparably better acquainted with comparative anatomy and the natural history of animals, than with physiology. He was entirely correct when he said that, “judging from his structure, the *natural* food of man appears to consist of fruits, roots, and other esculent parts of vegetables;”—but when he said that, “once possessed of fire, and those arts by which he is aided in seizing animals, or killing them at a distance, every living being was rendered subservient to his nourishment, thereby giving him the means of an infinite multiplication of his species,” he only offered a fanciful apology for the carnivorous habits of a considerable portion of the human family.—But the truth is that if man chooses to eat flesh, his jaws and teeth will not only allow him to eat it raw, but they and all his other alimentary organs and all the physiological interests of his body, will suffer less injury from eating it in that state than from eating it after it has been cooked by fire.

§ 1289. If however, the civilized portion of the human race will not consent to eat their flesh-meat entirely raw, the best mode of cooking it is to roast, or broil, or boil it.—The old-fashioned way of roasting flesh, suspended by a string before a large fire, and constantly turned round till it is moderately done through, is perhaps the very best manner of cooking it.—Boiling renders it less

stimulating and also less nourishing.—Stewing flesh is a more objectionable mode of preparing it; and frying it in fat or grease of any kind is decidedly the most pernicious manner in which it can be prepared by culinary art. It is enough to break down the digestive powers of any stomach.—The muscular fibre and other parts become thoroughly permeated and saturated with the hot fat; so that if the flesh thus cooked, is ever so much masticated or retained ever so long in the mouth, the particles cannot imbibe the saliva, (§ 426.) and they descend into the stomach, prepared to resist the action of the gastric fluid and all the physiological powers of that organ, and thus to retard digestion, and cause irritation and derangement of function, and prepare the way for a terrible train of evils.

§ 1290. Flesh soups and broths are also very objectionable forms of animal food. Soups are altogether too complicated to be healthy. Besides, it may be laid down as a general and very important rule, founded on the anatomical and physiological laws of the human system, that in proportion as artificial preparations of food render the function of mastication unnecessary, they are injurious to the teeth, (§ 719.) and detrimental to all the alimentary organs, and to the physiological interests of the whole system. I am aware that flesh broths, chicken broth, &c. have formerly been very commonly ordered by physicians for their convalescent patients;—but practising physicians have not all been very careful to make themselves thoroughly acquainted with those physiological laws which should govern them in prescribing the diet of the sick; and this is probably one of the principal reasons why they have not been more successful in the treatment of disease.

§ 1291. We have seen, (§ 748.—755.) that every

kind of concentrated aliment is more or less injurious to the stomach and through it to the whole system.—Flesh broths consist of a quantity of water, holding in solution or in a fluid state, some of the nutrient principles of the flesh in a very concentrated form. When this kind of food is swallowed into the stomach, the very first duty which that organ performs, is to take up, (§ 450.) with its absorbents, (§ 452.) all the water which contains the concentrated nutrient principles of the flesh, and with the water, the salt, if any, held in solution by it, while the concentrated animal matter is retained in the stomach, like a kind of sediment, to be digested into chyme, and pass into the intestinal tube like other food;—and as there is no mastication of this food, and consequently no mixture of saliva with it in the mouth, when the water of the broth is all absorbed, the remaining concentrated animal matter is left even more dry than is the ingested food which was received into the mouth in a solid form and freely masticated and mixed with the salivary fluid.—Moreover, solid aliment, when properly masticated and slowly swallowed into the stomach, always excites a more ready and more copious secretion of the gastric juice, and a more free and vigorous action of the muscular tissue of the stomach.—Flesh broths therefore, always serve to vex and irritate and to debilitate the digestive organs; and should be particularly avoided by those whose digestive powers are feeble.

§ 1292. Salted flesh and fish of every kind, are less easily digested and less nourishing than fresh; yet they will sustain a laboring man longer, because they pass less rapidly through the stomach, (§ 1025.) and for this reason, salted pork, is commonly considered the best food for hard-laboring men; as,—to use their own language—it will stick by them longer than any other food. Salt is

itself an indigestible substance, and when it has penetrated animal substances so as to preserve them from the process of putrefaction, it renders them much more difficult of digestion, and consequently, in some degree causes irritation to the digestive organs. Fat pork thus preserved, being an oily substance, as well as containing salt, is still longer in passing through the stomach, than other kinds of salted animal food;—and when the digestive organs have sufficient vigor to perform their functions in spite of its disturbing qualities, the individual feels himself remarkably well sustained in the gastric region, by such aliment;—yet if he is an accurate observer of his own experience, he will soon learn that, though his stomach is longer kept employed by salted pork, his body is not saved by it from great weariness, at the close of his day's labor. This weariness, which is scarcely felt at all by the laborer who subsists on a pure vegetable diet, is much increased by the protracted employment of the stomach in disposing of the salted pork. (§ 1276.—1280.)

§ 1293. Flesh and fish that are both salted and smoked, are yet more difficult of digestion; and more oppressive and irritating to the assimilating organs. Yet it is not uncommon to see upon the breakfast table of feeble invalids, a dish of salted and smoked fish, broiled and perfectly saturated with butter, and perhaps also dressed with mustard and pepper.—Such a dish is enough to give a hyena a fit of dyspepsy.

§ 1294. From what has been said concerning the dietetic use of animal fat, (§ 1273.) it must be very obvious that gravies of every kind, containing oily matter—whether the drippings of the flesh or melted butter, are exceedingly objectionable and mischievous.—Indeed, most of the made gravies on our public and fashionable

tables, and all too common everywhere in civic life, are execrable compounds which are infinitely more fit for the soap-boiler's vat, than for the human stomach!—It is not easy to use language too strong, in reprehension of these vile dishes:—for it would not be easy to measure the extent of the evil which they cause. They are truly abominable preparations and ought to be regarded with deep and permanent abhorrence.

§ 1295. Concerning the use of BUTTER as an article of diet, it is somewhat remarkable that with all the diversity of opinions in regard to the food of man, nearly all who have written or spoken on the subject of human aliment with reference to health, have been entirely agreed in considering this favorite article as decidedly objectionable,—and some have spoken of it in the severest terms of condemnation. Dr. Beaumont's experiments and observations (§ 431.) fully prove that when butter is taken into the stomach with other substances, “it becomes a fluid oil and floats upon the top of the chymous mass, retaining its oily character and appearance, till all the other contents of the gastric cavity, are nearly, or entirely chymified and emptied into the duodenum,” (§ 338.) and it, like all other animal fat, (§ 1277.) is digested only, by being first acted on by a portion of bile and converted into a kind of saponaceous substance, and then it receives the action of the proper solvent fluid of the stomach. The point is therefore, for ever established beyond all controversy that butter is better avoided than eaten by mankind.

§ 1296. But if civilized human beings are determined to continue the use of butter, in spite of every physiological demonstration, and in defiance of consequences, then certain regulations in regard to it, at least, should be observed.—In the first place, none but the healthy and

vigorous and active and full-grown should ever presume to use it. Diseases of every kind, both acute and chronic are aggravated by it, though it may produce no distress, nor sensible disturbance in the stomach.—The delicate and feeble and inactive suffer more from it than the robust. And children and youth are always more injured by it than healthy adults:—and this is none the less true and important, because in consequence of the energy and elasticity of the youthful constitution, the injurious effects do not immediately manifest themselves by powerful and indubitable symptoms.—In the second place, none should be used but that which is perfectly sweet, and recently made from the milk of healthy cows, which are permitted to run at large in the open air, or if housed at all, kept in clean and well-ventilated stables, and fed on good, clean grass or hay of the best kind, free from weeds and every poisonous herb; for, every impurity or pernicious substance that finds its way into the bodies of the cows by absorption, will inevitably affect the quality of the butter. (§ 1304.) When butter becomes old and strong or rancid, it is still more offensive to the digestive organs, and more unfriendly to health.—In the third place, those who use butter at all, should use it very sparingly, and never in the melted form.

§ 1297. If a small quantity of butter is spread upon cold bread or other kinds of food, the article upon which it is spread may be masticated and freely mixed with the salivary fluid in the mouth, and thus its particles will be prepared to resist the penetrating quality of the butter when converted into oil, in the stomach, and prepared also, for the action of the gastric fluid. But, if the butter is spread upon hot bread or other kinds of food, or, is first melted and turned upon the food—unless it be some impenetrable substance—it will permeate it so

thoroughly, that, however finely it may afterwards be masticated or ground in the mouth, the particles being saturated with the oil, will wholly resist the action of the salivary fluid, and descend into the stomach prepared to stand out long against the action of the gastric juice. This is the reason why all kinds of pastry, in which butter or lard or some other kind of oily substance is freely and intimately mixed up with flour, are so exceedingly oppressive and embarrassing to the debilitated stomach, and always so trying and injurious even to the most vigorous and unimpaired digestive organs.

§ 1298. Bread toasted and completely saturated with butter, is a very common dish for those who are laboring under chronic disease; and yet few preparations of food could be worse for them. I have seen individuals in the last stage of pulmonary consumption, partaking freely of such a dish; and when I have remonstrated with them, they have defended the improper indulgence on the ground that it agreed perfectly well with their stomachs. Poor souls! they knew not that the iniquities of their stomachs were visited upon their suffering lungs and through them on the whole system: (§ 1105.) and that to this fact alone, their stomachs owed their immunity from distress whenever they partook of such a dish. (§ 521.) I have seen others laboring under painful chronic disease of many years' standing, frequently and freely partaking of hot short-cakes swimming in melted butter; and I have often seen them very much displeased when I pointed out to them the impropriety of their eating such food. It is needless to say that such invalids never recover health while they continue such practices. As a general rule then, butter should never be used in a melted form, nor upon any thing hot enough to melt it.

§ 1299. CHEESE, in the stomachs of dyspeptics, and

others of feeble digestive powers, is always a difficult thing to manage: but robust, active laboring men, of general simplicity of habits, are able to digest it in small quantities, without experiencing any immediate, sensible inconvenience, when it is pure and good, and used as a condiment with bread and other kinds of farinaceous food. Rich old cheese, which is most sought after by epicures, and which has been recommended by some, as a good promoter of digestion, is always digested with great difficulty, and causes much irritation in the stomach, and not unfrequently produces extensive eruptions or inflamed pustules or blisters of the mucous membrane of the stomach and mouth.—Cheese not more than three months old, made of milk from which the cream or oily matter has mostly been taken, is far more easily digested, and is in every respect, less unwholesome and less objectionable than that which is ordinarily considered the best. But in making this, as well as other kinds of cheese for market, it is quite fashionable for the manufacturers to put in annatto and even arsenic and other poisonous substances, to give it a rich and creamy appearance and taste. It is no uncommon thing for whole families to be made seriously sick by eating cheese which is thus adulterated.—The curd made by the ancients, and in modern times, by the Germans and others, and called pot-cheese, is decidedly the most wholesome cheese that is used.

§ 1300. MILK has been praised by almost every writer on human diet, as being one of the most nourishing and wholesome kinds of food that man can eat. Chemical physiologists have told us that it is the only single article which contains within itself, every element essential to human nourishment. Mr. Riley informs us that the Arabs of the desert live two or three hundred years, in

excellent health, exclusively on the milk of their camels. (§ 789.) Milk we know, is the natural food for children and the young of all mammiferous animals. And the experience of the human family for thousands of years, has proved that milk is a very nourishing and wholesome and invigorating article of food for man in almost every situation, condition, and circumstance, in which he may be placed. In short, there is a vast amount of evidence in favor of milk as an important article in the diet of mankind.—And it is very certain that, not only for those who are laboring under disease of any kind, and for the delicate and feeble and for the young and for the sedentary, but also for those whose situations and duties require the greatest bodily strength and activity, and ability to endure protracted fatigue and privation and exposure, a milk and vegetable diet is far better than a flesh and vegetable diet.—Nevertheless, eight years of very extensive experiment and careful observation, have shaken many of my preconceived opinions concerning milk as an article of human food.

§ 1301. The testimony of hundreds of individuals in all the various situations and conditions and circumstances of civilized life, is entirely unanimous on this subject.—All explicitly affirm that though they do better on a milk and vegetable diet, than on one of flesh and vegetables, yet they do best when they confine themselves to a diet of pure vegetable food and pure water. I have found that dyspeptics and invalids of every description, do better when they abstain from the use of milk than when they use it, and in many cases it is indispensably necessary to prohibit milk.—Farmers, mechanics, and others whose labors are severe, and who require great bodily strength and ability of endurance, all declare that they feel more vigorous and active, and labor with greater ease and elasticity, and experience less exhaust-

tion and sense of fatigue at the close of the day,—when they abstain from milk and subsist exclusively on vegetable food and water, than when they use milk.

§ 1302. And this general testimony from experience, is certainly in strict accordance with the anatomical and physiological evidence of the human system and the general analogy of nature.—The young of all mammiferous animals including those of the human species, naturally subsist for a certain period exclusively on milk. Those of the lower animals in a state of nature, in proper time, instinctively begin to accustom themselves to other kinds of food adapted to their systems, and finally, abandon their milk aliment entirely, and the fountains from which they drew it, wholly dry up.—The alimentary organs of children are in a condition requiring liquid food; and milk is peculiarly adapted to their physiological wants and powers.—As they grow older however, new organs are developed, (§ 324.) adapted to new functions and adapting the system to new kinds of aliment: and there is no good reason to doubt that, simultaneously with the development of the teeth, in a perfectly normal state of the system, correspondent changes take place in the physiological properties and powers if not in the anatomical properties of the digestive organs. So that, while they retain the capability of continuing to sustain the body on milk, they are fitted to serve the general interests of the system better on more solid forms of aliment.

§ 1303. On the whole then, as general rules for adult man:—those who are laboring under disease of any kind, and especially if the disease is of a serious character, and more particularly, if it is of an inflammatory nature, or one which all increased excitement of the system aggravates, had better abstain entirely from milk,—or at

most, only use it in the quantity and manner which I shall point out, when I come to speak of the various modes of preparing vegetable food. (§ 1411.) The sedentary, the studious and the delicate had better observe the same rule. Dyspeptics almost invariably find it oppressive to their stomachs, causing a sense of distention and heaviness. (§ 450.) It is possible however, that there may be particular cases, in which the invalid and the delicate and the sedentary may be benefited by a temporary use of a milk diet. This is a point to be decided by the intelligent physician who knows the symptoms and circumstances of the case; and by the careful observation of the individual. Those who are healthy and active and athletic can do exceedingly well on a milk and vegetable diet; but, as a general rule, they can do still better, by abstaining from the use of milk and subsisting wholly on a diet of pure and well-chosen vegetable food and pure water,—and by vegetable food I mean to comprehend all fruits and farinaceous seeds and roots and other kinds of esculent vegetables proper for human aliment.

§ 1304. Concerning the use of cows' milk as the food of children and youth, I shall speak more particularly in a subsequent lecture, when I come to treat of the diet and regimen proper for them. It is important to remark in this place however, that whether this kind of food be used for the nourishment of children or adults, the utmost care should be taken that it is of a good quality.—We have seen (§ 1274.) that whatever foreign substance is introduced by absorption into the vital domain of the animal body is mingled more or less extensively with the blood: and in proportion to its deleteriousness or offensiveness to the vital properties of the system, so is the rallying of the vital forces to expel it as soon as possible from

the circulation and to eliminate it from the body. (§ 516.) In such emergencies nature avails herself of all the means in her power to effect the expulsion, and consequently, all those organs which secrete or excrete substances which are designed to pass from the body, are largely employed in the general work of depuration. Hence if the cow or the female of any species of mammiferous animals, receive any poisonous or foreign substance into the vital domain by absorption, during the period of lactation, the milk is almost immediately affected by it. And it has been ascertained by experiment, that if two cows—the one nursing a calf and the other giving no milk, receive in their food a quantity of poison sufficient to cause death, the latter cow will be killed by it, while the calf of the former will be killed and the mother will escape.—In this way thousands of nursing infants have been distressed,—made sick,—thrown into convulsions and even killed by the poisonous substances voluntarily swallowed by their mothers and nurses; and in this way thousands of human beings have been made seriously sick, and many have been killed by the poisonous substances which cows have eaten.

§ 1305. But the milk of cows is far more frequently rendered exceedingly impure and unwholesome than actually poisonous. Every thing that affects the health of the cow correspondently affects the quality of her milk.—Impure and unwholesome food of every description,—improper confinement, impure air, filthy stables, and every thing else that by absorption or otherwise, affects her body unfavorably, inevitably deteriorates the milk and renders it unwholesome.—When cows are kept in dirty and ill-ventilated stables and the filth is suffered to remain upon their bodies, as is too generally the case during the winter, the milk always becomes highly charged with the

odor and taste of the filth: and when besides all this, the cows are fed on the vile dregs of distilleries and other improper substances, their milk is any thing but wholesome, and can hardly fail to impair the health of those who use it freely as an article of diet.—Even too stimulating food however pure, such as the meal of Indian corn and other kinds of grain, necessarily renders the milk less suitable for human aliment and especially for the food of children. Such food is given to increase the quantity of the milk, and always renders that secretion somewhat more exciting and febrile in its tendency.

§ 1306. The best milk therefore, can only be procured from perfectly healthy cows which during the season of grazing, run at large in the open field and crop their food from a pure soil, and during the winter, are fed on good hay; and if housed at all, kept in clean and well-ventilated stables, and every day thoroughly curried and cleaned, and supplied with pure water for drink, and suffered to take regular exercise in the open air. (§ 1296.)

§ 1307. The cream of milk, though capable of being converted into butter, yet, when recent and sweet, is perfectly soluble in water, and mixes freely with the fluids of the mouth and stomach: and therefore, if it is free from any deleterious properties, (§ 1304.—1306.) it is very far less objectionable than butter as an article of diet. It may be used instead of butter in a variety of ways; as I shall point out hereafter,—and without any sacrifice of gustatory enjoyment; but with decided benefit to health;—that is, if one or the other must be used. Nevertheless, as a general rule, the physiological interests of our bodies, are better served without the use of either.—The butter spoken of in the Scriptures, in connexion with honey, &c., as an agreeable article of food, was probably rich, sweet cream.

§ 1308. EGGS are somewhat more highly animalized than milk; and perhaps rather more exciting to the system. Yet when fresh and good, if taken raw or very slightly cooked by boiling or otherwise, without the use of fat or oily matter, they are not difficult of digestion; and are quite nourishing. But when they are so much cooked as to become hard or solid, they require a vigorous stomach to digest them without oppression. All that I have said concerning milk, and those by whom it may be used as food, (§ 1300.—1303.) I consider strictly applicable to eggs: but care should always be taken that they are not too old: and that their vitality is not in any measure impaired.

§ 1309. In closing my remarks on this general topic, I deem it proper to repeat what I have said, (§ 868, 869.) that, animal food of every kind, and particularly flesh-meat, when freely used, so affects the physiological powers of the digestive organs, that, they cannot chymify vegetable substances with the same ease and comfort, that they can when accustomed only to vegetable food. Hence, many kinds of fruits and vegetables, which a flesh-eater cannot partake of without more or less inconvenience, and which in certain seasons of the year, and during the prevalence of epidemics, are sure to make him sick, may be freely eaten with perfect comfort and safety by those who subsist wholly on vegetable food.

§ 1310. The conclusion of the whole matter then, concerning animal food, is briefly this; as a general and permanent rule for the human species, in all situations, conditions and circumstances, where man can have his choice of aliment,—it is best that every one should wholly abstain from flesh-meat;—but if any *will* eat it for the gratification of depraved appetite, it should only be those who are healthy and vigorous and active, and

much in the open air. And they should never allow themselves to indulge in the use of it more than once a day, and then in great moderation; and only prepared in the simple manner which I have described. (§ 1289.) All other kinds of food pertaining to the animal kingdom should as a general rule, be avoided by the diseased and the feeble and delicate. (§ 1262. Note.) In short, I am convinced that as a general and permanent rule, the whole human family would do best—after a certain period in very early life, to subsist entirely on the products of the vegetable kingdom and pure water.

§ 1311. In regard to the use of salt and other seasonings in preparing the different kinds of animal and vegetable substances for human aliment, I shall speak fully in a subsequent lecture.

LECTURE XXI.

What shall we eat?—The abundant supplies of the vegetable kingdom, and resources of the earth—General physiological laws in regard to preparing food, and the use of artificial means as aids to the vital powers—All artificial preparations of food, in themselves considered, are evil—General principles which should govern the artificial preparation of food, in relation to mastication, insalivation, deglutition, temperature, concentration, combination, quantity, &c.—Practical application of these principles—Primitive simplicity of food and manner of preparing it—The history of bread, and the kinds used by different portions of the human family—“Bread the staff of life”—Wheat the best material for loaf bread—Where and how raised and best prepared—Adulterations of bread—Coarse bread most wholesome—Properties of meal—Yeast—fermentation, &c.—Mixing, kneading and baking bread—Use of alkalies in bread-making—Alcohol in bread—How to keep bread sweet—Who should make bread—Bread-making the

highest art of cooking—Perfect bread-making the very top of culinary skill—Varieties of bread—Other less simple preparations from farinaceous substances—Cakes, &c.—Sweets and acids—All fats should be avoided—Cream and milk how used, if at all—Puddings, pies, &c.—Other vegetables, fruits, &c., how prepared and used—General conclusions in regard to the kinds, conditions, qualities, quantities and preparations of the food of man.

§ 1312. THOSE who have accompanied me thus far along my course, are, by this time, perhaps, disposed to cry out, with the multitudes who only know what they have learned from rumor concerning my opinions, What will you leave us to subsist on?—What shall we eat when all our customary food is taken away?—when flesh and every thing pertaining to the animal kingdom is denied us?

§ 1313. And has it come to this?—Is it indeed true that man is under the necessity of making his body a sepulchre for dead carcasses, in order to keep himself alive, and to preserve his civilization, and the elegant refinements and arts of civic life?—I do confess—and deeply regret that truth compels me to acknowledge that, in many portions of the civilized world, mankind have become so accustomed to depend on the products of the animal kingdom, for their principal articles of diet, that they have greatly neglected to develop and foster the capabilities of their more natural and proper source of aliment, and learned to think that starvation would be the inevitable consequence of an entire abandonment of animal food.

§ 1314. It is true that at the public tables of our steamboats and hotels, and in fact, all the fashionable tables in civic life, which almost literally groan beneath the multitudinous dead that lie in state upon them, embalmed and decorated like the bodies of Egyptian potentates prepared for solemn interment,—emitting their spicy

odors to disguise their natural loathsomeness,—it is true, that, at one of these tables, loaded apparently with every luxury and savory dainty that the market can supply and culinary skill prepare,—if one sits down, determined to abstain from animal food, and the still more pernicious preparations of vegetable substances, he may look in vain throughout the wilderness of viands before him, for a single dish of plain and wholesome vegetable food, such as a wise man would willingly and freely partake of. He might order any form of aliment that the products of the animal kingdom can be tortured into, which happens not to be upon the table, and he would probably, be promptly and with alacrity supplied;—but if he calls for a simple dish of fruits or vegetables, his call will either be utterly neglected, or he will be answered in a surly tone—“ We have not got them sir!”—and he may therefore either make his meal upon a crust of miserable bread, or conclude to fast entirely, and pay his dollar or half dollar for the refined and ennobling pleasure of seeing his more carnivorous, and literally omnivorous fellow creatures glut themselves, much after the same manner of the giant Polyphemus when he feasted on the quivering bodies of the Greeks which he had dashed to pieces in his wrath, excited by the fierceness of his appetite for flesh.

§ 1315. But is there a necessity for such a state of things?—Must it be so, that we must either deny ourselves every enjoyment of the table, or consent to become associated in our dietetic habits and character, with the hyena and the wolf and other beasts of prey? and with the vulture and the owl and bat, and other harpies of the winged kind?—Nature shudders and recoils, and answers —“ No!” in the deepest tones of loathing and abhorrence! —and points us to our beautiful mother earth, and asks us to contemplate her all-bountiful bosom;—and the still

greater capabilities of her soil, which, in the depths of our putrescent sensuality, we have too long and too ungratefully neglected and despised.—What! talk of starving, in the face of Heaven, when our benevolent Creator has spread for us so bountiful a table in the vegetable kingdom, of fruits and seeds and roots and other esculent substances innumerable; and which may be cultivated and multiplied in quantity and variety without bounds?—Why did not our first parents famish in Eden, when they kept the garden and fed on fruit?—Why have not the myriads of the human race who, from the earliest periods of the world even to the present hour, have subsisted on vegetable food, famished and left their portions of the earth depopulated? Indeed we do abuse our own nature and our God, when we suppose there is not in the products of the vegetable kingdom and in the capabilities of the soil, a full supply of nourishment for man; and such as is best adapted to sustain the highest physiological and psychological interests of his nature; and to afford him the purest and richest and most wholesome enjoyments of sense.

§ 1316. In regard to the preparations of vegetable food, when considered with reference to the very highest capabilities of human nature, it is unquestionably true that, in the climate most natural to man, (§ 1249.) his physiological interests would be best sustained by those vegetable products which require no culinary change, or cooking. (§ 770.) But as man migrates and becomes acclimated in different portions of the earth, where he finds it necessary to subsist on different vegetable, or other substances, it is possible that he may also find it necessary to prepare some of those substances by fire or otherwise, in order to render them most compatible with his organ-

ization, and his physiological properties and powers and interests.

§ 1317. It is a general physiological law of organized bodies, to which there is no exception, that, all artificial means to effect that which the living body has natural faculties and powers to accomplish, always and inevitably impair, and tend to destroy the physiological powers designed to perform the function or to produce the effect. Thus, as we have seen (§ 719.) every artificial means substituted for the natural and proper use of the teeth in mastication, inevitably injures those organs and always tends to destroy their power to perform the function for which they were intended. And thus, every artificial means employed for the regulation of the temperature of the body always and inevitably diminishes the natural power of the body to regulate its own temperature. (§ 500.) If our feet are cold—for instance—and we, by walking, dancing or other exercise of the lower limbs, increase, in a natural and healthy manner, the calorific function of the feet, and thus restore them to a comfortable temperature, we invigorate all the physiological powers of the parts, compatibly with the general physiological interests of the body:—but if instead of this, we warm our feet by a fire, we necessarily weaken all the physiological powers of the parts, and consequently diminish the calorific function of the feet, or their natural power to generate animal heat and regulate their own temperature, and thereby render them more liable to suffer from cold.—All this is true of every other member and part of the system:—and also, accurately illustrates the effects of all other artificial means, on the physiological powers of the body. (§ 418.)

§ 1318. It may therefore, be laid down as a general law, that all processes of cooking, or artificial preparations

of food by fire, are, in themselves, considered with reference to the very highest and best condition of human nature, in some degree detrimental to the physiological and psychological interests of man. (§ 735.) Yet inasmuch as man may be so situated as to be under the necessity of subsisting on substances which are less wholesome in their natural state than when properly prepared by fire, therefore, in such cases, the evil of the artificial preparation by the process of cooking, would be less than that which it would prevent; and consequently it would be a *necessary* evil; and in effect, a relative good.

§ 1319. This view of the subject, presents the matter in a simple and true light, and clearly teaches us that, whatever may be the situation and circumstances and diet of man, cooking, or the artificial preparation of his food by fire, or otherwise, is always to be considered as a real and actual evil, except in so far as it is rendered indispensably necessary to his physiological interests, by the character of the substances on which he is compelled to subsist:—and when thus rendered necessary, it should always be governed by the laws of constitution and relation established in his nature; (§ 693.—767.) or in other words, the preparations should always be made—as far as possible—consistent with his organization and with his physiological properties and powers.

§ 1320. If man were to subsist wholly on alimentary substances in their natural state, or without any artificial preparation by cooking, then he would be obliged to use his teeth freely in masticating his food, (§ 719.) and by so doing, not only preserve his teeth from decay, and keep them in sound health, (§ 723.) but at the same time, and by the same means, he would thoroughly mix his food with the solvent fluid of his mouth, (§ 426.)

and thus prepare it, both for swallowing and for the action of the stomach; (§ 426.) and by the same means also, he would be made to swallow his food slowly, as the welfare of the stomach (§ 429.) and of the whole system requires he should.* (§ 727.)

§ 1321. Again, if man were to subsist wholly on uncooked food, he would never suffer from the improper temperature of his aliment. (§ 500.) Hot substances taken into the mouth, serve more directly and powerfully to destroy the teeth, than any other cause which acts immediately upon them; (§ 724.) and hot food and drink, received into the stomach, always, in some degree, debilitate that organ, and through it, every other organ and portion of the whole system; diminishing, as an ultimate result, the vital power of every part,—impairing every function, and increasing the susceptibility of the whole body to the action of disturbing causes, and predisposing it to disease of every form. Moreover, the use of hot food and drink, always and inevitably diminishes gustatory power and enjoyment. On this point the most egregious error of opinion prevails, wherever fire is employed in the preparation of human aliment. It is universally believed that a high temperature of food gives it a greater relish; but the contrary is true. Heat acts on the gustatory nerve, like other stimulants—always diminishing the power of that organ to perceive and appreciate the delicate qualities of alimentary substances,

* On introducing food into the stomach of St. Martin, (§ 431. Note) through the artificial aperture, Dr. Beaumont found that the organ would not receive it rapidly even in the liquid state. "If a few spoonfuls of soup or other liquid diet, be put in, with a spoon, or funnel," says he, "the rugæ quickly close upon it, and gradually diffuse it through the gastric cavity, entirely excluding more during this action. When a relaxation takes place another quantity will be received in the same manner." (§ 426.—429.)

(§ 712.) and hence, they who never receive any thing into the mouth warmer than the blood, always—other things being equal—have the nicest gustatory perception, and the richest and most varied gustatory enjoyment of their food. This, every one may demonstrate for himself by a fair experiment of three months' entire abstinence from hot food and drink, and other hot substances. By a general abstinence from these things also, diseases of the throat, lungs, and indeed, of every part of the body, would be far less numerous and frequent than at present. In short, many and great benefits would result, without the sacrifice of a single good or real comfort, or the production of a single evil, from the total and universal abandonment of hot food and drinks: and however complicated and pernicious the artificial preparations of our aliment may in other respects be, there certainly is no necessity for its being received into the mouth and swallowed when it is hot, or even warm.

§ 1322. Again, if man were to subsist entirely on food in a natural state, he would never suffer from concentrated aliment. We have seen (§ 747.—764.) that every substance in nature suitable for the food of man, consists of both nutritious and innutritious matter;—varying in proportions, in different substances, from three or four per cent. of nutritious matter, up to ninety, or ninety-four per cent. (§ 900.) But nature, without the aid of human art, produces nothing for the alimentary use of man, which is purely a concentrated nutrient principle. And the human body, as we have seen, (§ 693.—767.) is organized and endowed with precise and determinate reference to this state of things: and hence, as we have seen, (§ 761.) a due proportion of innutritious matter in our food, is as important to health, as nutritious matter is.—Human beings may subsist from

childhood to old age, on a simple diet of potatoes and pure water, exclusively, and enjoy good and uninterrupted health; and possess great muscular power and ability to endure protracted fatigue and exposure. But if the purely nutrient matter be separated out, by artificial means, and human beings be fed exclusively on this concentrated form of aliment and pure water, they will soon perish; (§ 748.)—not because this matter contains no azote or nitrogen, nor because man *necessarily* requires a variety of alimentary substances, (§ 748.) but simply and exclusively because the anatomical construction and physiological powers of the alimentary organs of the human body, are constitutionally adapted to food which consists of both nutritious and innutritious matter.*

§ 1323. Again, if man subsisted wholly on uncooked food, he would, not only be preserved from improper concentrations, but also from pernicious combinations of alimentary substances. We have seen (§ 862.—868.) that the alimentary organs of man, like those of the horse, ox, sheep, dog, cat, and most, or all other animals of the higher orders, if not, in fact, of all other animals, without limitation, possess the physiological capability of so accommodating themselves to emergencies, that, they can be made to digest almost every vegetable and animal substance in nature, and they can by long training, be educated to digest a mixture of these substances at the same time. Nevertheless, it is incontrovertibly true that, the alimentary organs of man and of all other animals, can digest one kind of food at a time, better than a mixture of

* “Bulk,” says Dr. Beaumont, “is nearly as necessary to the articles of diet, as the nutritive principle. They should be so managed that one will be in proportion to the other. Too highly nutritive diet is probably, as fatal to the prolongation of life and health, as that which contains an insufficient quantity of nourishment.”

different kinds;—for, it is impossible that the solvent fluids secreted by the stomach and other organs belonging to the alimentary apparatus, (§ 426.—457.) should be, at the same time, equally well adapted to entirely different kinds of food.

§ 1324. I do not say that the alimentary organs of man, cannot, by long habit, be brought into such a state as that, while that state remains, they will not digest a mixture of animal and vegetable food, with more immediate comfort and satisfaction to themselves and the individual, than they will vegetable food alone. But this does not militate in the least, against the general principle which I have advanced, for, it is nevertheless true that the same organs are capable of being brought into a state in which they will digest a meal of unmixed food, of either kind, with less embarrassment and injury to themselves and to the whole system, than they can the mixed food in any state. Hence it is a general physiological law concerning the dietetic habits of man, that simplicity of food at each meal, is essential to the highest well-being of the individual and of the race.

§ 1325. God has unquestionably, provided a great and rich variety of substances for man's nourishment and enjoyment; but it is equally certain that he did not design that man should partake of all this variety at a single meal; nor in a single day; nor season;—but from meal to meal,—from day to day, and from season to season;—varying his enjoyment in strictest consistency with the great laws of his nature. And hence all artificial combinations of alimentary substances,—and particularly of a heterogeneous kind,—and yet more especially, the concentrated forms, (§ 760.) must be more or less pernicious to the alimentary organs, and, through them, to the whole system.

§ 1326. Finally, if man subsisted wholly on uncooked

food, the undepraved integrity of his appetite, (§ 767.) —his thorough mastication (§ 727.) and slow swallowing, and his simple meal, would greatly serve to prevent his *over-eating*, and thus save him from the mischievous effects of one of the most destructive causes operating in civic life. For excessive alimentation is indubitably, the cause of more disease and premature death in civilized man, than any thing else which affects his existence; and there is no other possible way by which the evil can be removed, consistent with the highest physiological interests of the human constitution, than by a stern simplicity of diet,—commenced in childhood and rigidly adhered to through life.

§ 1327. In all our artificial preparations of food therefore, these important principles or general rules should ever be kept in view, and an intelligent and reasonable and conscientious regard to them should always be entertained and cherished; and particularly by woman, whose dominion over these matters, as the wife and the mother, gives her immense power to act, either as the angel of mercy or of wo to the human race!—as the angel of mercy, if in the integrity of her soul, she leads the way in truth and holiness, and teaches those, on whom her moral influence is exerted, to follow her;—as the angel of wo, if she suffers sensual gratification to seduce her from the path of and becomes the minister of depraved appetite and indulgence.

§ 1328. Whatever may be the kind of food on which man subsists, when the artificial preparation is made as far as possible in accordance with the physiological laws of constitution and relation established in his nature (§ 693.—767.) and is of that simple character which leaves the proportions of nutritious and innutritious properties as nature combined them, (§ 747.) or, in the gen-

eral average, conforms in this respect to nature,—and effects little change in the nutritious principles,—and retains the natural requisition for the function of the teeth (§ 426.) and thus secures the proper chewing of the food,—and the mixing of it with the solvent fluid of the mouth, (§ 726.) and the swallowing of it slowly, (§ 727.) —the artificial process of preparation militates very little, if at all, against any of the physiological interests of the body. But if the preparation concentrates the nutrient properties, and destroys the due proportion between the bulk and nourishment; and effects improper changes and combinations in the nutrient elements, and does away the necessity for mastication; and presents the food in too elevated a temperature, and enables us to swallow it too rapidly with little or no exercise of the teeth, and without properly mixing it with the saliva, the artificial process or cooking is decidedly, and often exceedingly inimical, not only to the physiological interests of the alimentary organs, but of the whole human system. And let it ever be remembered that, as a general rule, the processes of cooking when regulated in the very best manner, cannot so perfectly adapt the substances which it is necessary to cook, to the physiological properties and powers of the human body, as to render them equally conducive to the highest and best condition of man, with those substances which are naturally adapted to his alimentary wants. (§1250.) And therefore, as already stated, (§ 1318.) all processes of cooking, or artificial preparations of food by fire—considered in reference to the very highest capabilities of human nature—must be regarded as in some measure an evil: and the grand desideratum is to ascertain how far the various circumstances in which man is placed, and the quality of the aliment on which he is obliged to subsist, render this evil neces-

sary;—or to what extent the artificial preparation of food can be carried without causing a greater evil than it prevents.

§ 1329. In the application of these principles to the various situations and circumstances in which man may be placed, we readily perceive that, the first great question is,—What are the substances *necessarily* entering into the diet of man, which require cooking, or any kind of artificial preparation, in order to render them most genial to the physiological interest of the human constitution?—The second great question is,—What kind or manner of preparation of those substances, do the highest physiological interests of man require or admit of?—and the third question is,—To what extent, and in what manner may we artificially prepare other substances, which we *choose* to comprehend in our diet, without seriously infringing our physiological and psychological interests?

§ 1330. To enter into these several inquiries with critical accuracy and complete detail, would not only require a very great deal of time, but also an intimate and perfect knowledge of the alimentary character of all the substances which man, in all the varieties of situation and circumstances of the species, may find it necessary or convenient, or agreeable to eat.—It cannot therefore be expected that I shall, in this place, attempt it to any considerable extent.

Bread—Bread-making.—The History of Bread, &c.

§ 1331. It is nearly certain, as I have already stated, (§ 782.) that the primitive inhabitants of the earth ate their food with very little, if any artificial preparation. (§ 779.) The various fruits, nuts, seeds, roots and oth-

er vegetable substances on which they subsisted, were eaten by them, in their natural state, with no other grinding than that which was done by the teeth.—As the human family increased and population became more dense and extended, and providential measures more necessary, the condition and circumstances of society gradually led to the invention and adoption of the simple, and, at first, rude arts of domestic life. (§ 20.) Among these, was that of bruising the harder articles of their food, such as nuts and seeds, or grain, on flat stones, selected and kept for the purpose. By constant use, these stones in time became hollowed out; and being thereby rendered more convenient, men at length began to form mortars and pestles from stones; and probably the next step was the construction of the rude kind of hand-mills, which continued in use for many centuries; and indeed, which, with the stone mortars, have, throughout all ages and in almost every portion of the earth, been used in the ruder states of society.

§ 1332. When men became acquainted with the use of fire, they probably often parched their corn or grain before they pounded it; and afterwards, they learned to mix it with water into the consistency of dough, and to bake this, in an unleavened or unfermented state, on flat stones before the fire, or in the hot ashes or hot earth, or in the rude ovens which they formed, by digging holes in the earth, into which they put heated stones, and slightly covered them with leaves or grass, and then laid in the article they wished to bake, and over this strewed some leaves, and then covered the whole with earth.* This kind of unleavened bread, undoubtedly constituted a very important, if not the principal article of artificially

* In this same manner the Sandwich Islanders cooked all their food, when they were first discovered.

prepared food in the diet of the primitive inhabitants of the earth, for many centuries; and the same, or very nearly the same kind of bread continued in general use down to the days of Abraham; and it is probable that the unleavened bread used by his descendants at the feast of the Passover, before and after they left Egypt, was of the same kind.

§ 1333. It is hardly possible, however, that it could have been otherwise, than that, at a much earlier period, larger quantities of this dough were occasionally made, than were immediately baked, and consequently portions of it were suffered to stand and ferment; and by this means, men were in process of time learned to make leavened, or raised bread.—At how early a date, loaf or raised bread came into common use, it is impossible now to ascertain with any considerable degree of precision. The scriptures do not afford us any evidence that Abraham was accustomed to such bread; but the fact that Moses, at the institution of the supper of the Passover, the night before the Jews left Egypt, commanded them strictly to abstain from leavened bread, and to eat only the unleavened, proves conclusively, that the Israelites at least, were then accustomed to fermented, or raised bread.

§ 1334. Neither history nor tradition enables us to speak with any degree of confidence in regard to the period at which other nations became acquainted with the art of bread-making; but from all that has come down to us from ancient times, we learn that the primitive generations of every nation, subsisted on fruits and other products of the vegetable kingdom, in their uncooked or natural state. (§ 779.) “The Greeks assert that they were taught the art of making bread by their god, Pan; and Pliny informs us that this art was not known at Rome

till near six hundred years after the foundation of that city. The Roman armies, he says, on their return from Macedonia, brought Grecian bakers into Italy. Before this time, the Romans prepared their meal in a kind of pap or soft pudding; and on this account Pliny calls them pap eaters."

§ 1335. But though the Egyptians and Israelites were probably among the earliest portions of the human family who became acquainted with the art of making loaf or raiscd bread, the quality of their bread continued to be exceedingly simple and coarse, for many generations. Even after the establishment of the Hebrew nation in Palestine—in the most splendid days of Jerusalem—at the period of the highest refinement of the Jews in the arts of civil and domestic life, their fine flour, from which their choicest bread and cakes wcre made, was, in comparison with modern superfine flour, extremely coarse,—ground mostly by females, in hand-mills constructed and kept for that purpose.

§ 1336. From Rome the art of bread-making very slowly found its way over considerable portions of Europe. A thousand years after Julius Cæsar first entered Britian, the rude people of that country were little acquainted with raised bread. "Even at present," says Professor Thomson, "loaf bread is seldom used except by the higher classes of inhabitants, in the northern countries of Europe and Asia."

§ 1337. In Eastern and Southern Asia, rice principally constitutes the bread of the inhabitants, and this is generally prepared with great simplicity. In Middle and Western Asia, and in Africa, bread, though consisting of different kinds of grain, is prepared with almost equal simplicity. In Scotland, Ircland, and indeed throughout Europe generally, the bread of most of the laboring peo-

ple, or peasantry, consists of barley, oats, rye, potatoes, peas, beans, chestnuts, and other farinaceous vegetables. In the islands of the Pacific and Southern oceans, the bread of the inhabitants consists of the plantain, bananas, yams, bread-fruit, and other like vegetables, simply roasted, baked, or boiled.

§ 1338. Bread, in the most extended sense of the word,* therefore,—of some kind or other,—made of some of the farinaceous products of the vegetable kingdom, has probably, in almost every portion of the world, and every period of time, been one of the first, and most important, and universal articles of food, artificially prepared by cooking, which has entered into the diet of mankind; and hence it has with great propriety been called “the staff of life.”

§ 1339. If we contemplate the human constitution in its highest and best condition,—in the possession of its most vigorous and unimpaired powers,—and ask, What must be the character of our bread in order to preserve that constitution in that condition? the answer most indubitably is, that the coarse unleavened bread of early times, when of proper age, was one of the least removes from the natural state of food,—one of the simplest and

* In the English version of the sacred scriptures, the term bread is frequently used to signify vegetable food in general. Thus in Gen. iii. 19. the Lord says to Adam—“In the sweat of thy face shalt thou eat bread (or food) till thou return to the ground.” See also Gen. xviii. 5. and xxviii. 20. and Ex. ii. 20. The most extended sense of the word, however, according to general usage, comprehends all farinaceous vegetable substances included in the diet of man; such as the farinaceous seeds or grain, nuts, fruit, roots, &c. And in this extended sense, bread, in some form or other, has been the principal article in the diet of mankind, from the earliest generations of the human race, to the present time; except among the few, small and scattered tribes, which have, perhaps, ever since the days of Noah, in different parts of the earth, subsisted mainly on animal food.

most wholesome forms of artificial preparations, and best adapted to fulfil the laws of constitution and relation; (§ 1320. *et. seq.*) and therefore, best adapted to sustain the most vigorous and healthy state of the alimentary organs, and the highest and best condition of the whole nature of man, as a general and permanent fact; and hence, it is very questionable whether loaf or raised bread can be made equally conducive to all the interests of our nature, with the simple unleavened bread. I am aware that many professional men entertain a very different opinion on this subject, and speak of unleavened bread as being less nourishing and less easily digested. This may be true to a limited extent, in special cases of impaired and debilitated alimentary organs; but I am confident that as a general fact, the notion is entirely erroneous.

§ 1340. "The whole people of Asia," says Dr. Cullen, "live upon unfermented rice. The Americans, before they became acquainted with the Europeans, employed, and for the most part, still employ their maize in the same condition. Even in Europe, the employment of unfermented bread, and unfermented farinaceæ in other forms, is still very considerable, and we are ready to maintain that the morbid consequences of such a diet are very seldom to be observed. In Scotland, nine tenths of the lower classes of people—and that is the greater part of the whole—live upon unfermented bread and unfermented farinaceæ in other forms, and at the same time, I am of opinion that there are not a more healthy people anywhere to be found. We give it to all classes and both sexes with advantage."

§ 1341. It is incontestibly true, that if two portions of the same kind of wheat-meal be taken and made, the one into unleavened and the other into leavened bread, and both be eaten warm from the oven, the leavened

bread will prove much more oppressive and difficult to digest in the stomach than the unleavened. But aside from the changes that are produced by the process of fermentation, there are many other considerations why unleavened bread of a proper quality and age, is better adapted to sustain the alimentary organs and general constitution of man in their highest and best condition. Nevertheless, it is very certain, that loaf or raised bread can be made so nearly in accordance with the vital laws and interests of our bodies, as scarcely to militate against them in any perceptible or appreciable degree. And when I say this, I mean not merely its effects on the health and longevity of a single individual, but its effects upon the human constitution, through successive generations, for a thousand years or more.

The best Material for Loaf Bread—how prepared, &c.

§ 1342. Among the materials used for making raised bread in our country—and, in fact, of all the known productions of the vegetable kingdom in any country, wheat is decidedly the best; and it is a remarkable fact, that wheat comes nearer to man than perhaps any other plant, in its power of becoming adapted to different climates, over a wide extent of the earth's surface, so that it may almost be said that wherever the human species can flourish, there wheat can be cultivated.

§ 1343. "It is not certainly known," says Professor Thomson, "in what country wheat was first produced. Mr. Bruce informs us that he found it growing wild in Abyssinia; and in his opinion, that kingdom is the native country of the plant. It would seem," continues the Professor, "to be originally an African plant, since it thrives best in Barbary and Egypt; and perhaps the

mountains of Abyssinia, though within the torrid zone, may not differ much in point of climate, from the more northern plains of Egypt. Wheat is perhaps cultivated over a greater extent of the globe than any other plant. Excellent crops are raised as far north as Sweden, in latitude 60 degrees; it is cultivated in the East Indies, considerably within the limits of the torrid zone; and in the north of Hindostan, it constitutes a chief article in the food of the inhabitants. In India, however, the plant seems to have deteriorated. It is always dwarfish, and the crop is said to be less abundant than in more northern climates." Yet a cold climate is not most genial to the nature of this plant. "The wheat of France is superior to that of England; the wheat of Italy is still better than that of France; and perhaps the best of all is raised in Barbary and Egypt."—Excellent wheat is raised in the southern and western and middle portions of the United States; and even in the northern and eastern parts of New England, very fine crops have been produced.

§ 1344. But the wheat and other cultivated products of the vegetable kingdom appropriated to the nourishment of man, like those on which our domestic animals subsist, (§ 1270.) are too generally, in civilized life, very considerably deteriorated, as to their wholesomeness, by the improper tillage of the soil. I have no doubt that it is true, as stated by those who have made the experiment, that the flour of wheat, raised on a cultivated soil recently dressed with crude, stable manure, may readily be distinguished by its odor, from the flour of wheat raised on a new and undravaged soil, or from that raised on a cultivated soil which has been dressed with properly digested manure. And if such and similar results of improper tillage can become the sources of serious evil to the human family, through their effects on the flesh of

animals which man devours, and on the milk and butter which he consumes, (§ 1304. *ct. seq.*) surely the immediate effects of such a deteriorated vegetable aliment on the human system, must be very considerable.

§ 1345. They who have never eaten bread made of wheat, recently produced by a pure virgin soil, have but a very imperfect notion of the deliciousness of good bread, such as is often to be met with in the comfortable log houses in our western country. It is probably true that the new soil, in its virgin purity, before it becomes exhausted by tillage, and debauched by the means which man uses to enrich and stimulate it, produces most, if not all kinds of vegetables appropriate for human aliment, in a more perfect and healthy state, than any soil which has been long under cultivation, can be made to do. Nevertheless, by a proper application of physiological principles to agriculture, many of the evils which now result from improper tillage may easily be avoided, and the quality of all those vegetable substances which enter into the diet of man may be very greatly improved, both in regard to wholesomeness and deliciousness. But while the people of our country are so entirely given up as they are at present, to gross and promiscuous feeding on the dead carcasses of animals, and to the untiring pursuits of wealth, it is perhaps wholly in vain for a single individual to raise his voice on a subject of this kind. The farmer will continue to be most eager to increase the number of his acres, and to extort from those acres the greatest amount of produce, with the least expense of tillage, and with little or no regard to the quality of that produce in relation to the physiological interests of man, while the people generally, are contented to gratify their depraved appetites on whatever comes before them, without pausing to inquire whether their indulgences are

adapted to preserve or to destroy their health and life. Yet if some one does not raise a voice upon this subject, which shall be heard and heeded, there will soon reach us, as a nation, a voice of calamity which we shall not be able to shut our ears against, albeit we may in the perverseness of our sensualism, incorrigibly persist in disregarding its admonitions, till the deep chastisements of outraged nature shall reach the very “bone and marrow” of the human constitution, and fill our land with such a living rottenness, as now in some other portions of the earth, renders human society odious and abominable. Whether, therefore, my voice shall be heard and heeded or not, I will obey the dictates of my sense of duty, and solemnly declare that this subject demands the prompt and earnest attention of every agriculturist and of every friend to the common cause of humanity; for it is most certain, that until the agriculture of our country is conducted in strict accordance with physiological truth, it is not possible for us to realize those physical, and intellectual, and moral, and social, and civil blessings for which the human constitution and our soil and climate are naturally capacitated.

§ 1346. Sometimes, in consequence of the peculiarities of the season, or climate, or soil, or some other cause, there will be a species of disease affecting the wheat and other grains: and this may be of such a character as not easily to be removed nor counteracted by any means; but more generally the rust, and smut, and dust, which attach themselves to the skin of the grain, may, by proper care, be so far removed, as at least to render the meal or flour far more pure and wholesome than it otherwise would be. And here let me remark, that they are greatly deceived, who suppose that the bolting cloth which separates the fine flour from the outer skin or bran,

also separates the impurities attached to the outer skin from the flour. By the process of grinding, these impurities are rubbed from the outer skin, and made quite as fine as any portion of the flour, and for the most part, pass with the fine flour through the bolting-cloth. To remedy this, it is perhaps generally true, that in large flouring establishments, a kind of smut or scouring-mill is in operation, through which the wheat passes, and is pretty thoroughly rubbed or scoured without being broken; and after this, it passes through a screen or winnowing mill, and thus is tolerably well cleansed and prepared for grinding. Yet this process by no means renders the wheat so perfectly clean and wholesome as washing.

§ 1347. Those who have given little attention to this subject, will probably think that the trouble of washing all their bread-stuff before it is ground, would be much greater than any benefit which would result from it. But a short experience in the matter, would convince every one who has a proper regard for the character of his bread, that the trouble of washing his grain bears no comparison to the improvement effected by it. Indeed, they who become accustomed to washing their grain, will soon cease to regard it as a trouble; and the improvement in the whiteness and sweetness of their bread will be so great, that they would be extremely unwilling to relinquish the practice.

§ 1348. When people are so situated that they can have things as they wish, they will also find that their bread is much richer, if the grain is ground but a short time before it is cooked. The best way, therefore, is, for every family to raise or purchase a sufficient quantity of the best new wheat that can be produced by proper tillage in a good soil, and put that away in clean casks or bins, where it will be kept perfectly dry and sweet; and, according to

the size of the family, take, from time to time, as they need it, one or two bushels, and wash it thoroughly but briskly in two or three waters, and then spread it out on a drying sheet or table, made for the purpose, and which is considerably inclined, so that the water remaining with the wheat will easily run off.—The skin or bran of the wheat is so well protected by its own oily property, that little or no water will penetrate it, unless it be suffered to remain in the water much longer than is necessary. Being thinly spread out upon the sheet or table in a good drying day, it will be sufficiently dry in a few hours for grinding. And I say again, let any one who loves good bread, wash his grain a few times in this manner, and he will be very reluctant to return to the use of bread made of unwashed grain.

§ 1349. It would be difficult to ascertain at how early a period in the progress of society, mankind, in the preparation of wheat for bread-making, began to put asunder what God has joined together, and to concentrate the more purely nutrient properties, by separating the flour from the part commonly called the bran. The Bible speaks of fine flour or meal, as a portion of the meat-offerings of the temple, but it is not probable this approached very near to the superfine flour of the present time. We are informed also that the Romans, more than two thousand years ago, had four or five different kinds of bread—one of which was made of the purest flour, from which all the bran was separated. This was eaten only by the rich and luxurious. A second kind, in more common use, was that from which a portion of the bran was taken: and a third kind, which was more generally used than any other, was that which was made of the whole substance of the wheat. A fourth kind was made mostly of the bran, for dogs. But at whatever

period in the history of the race, this artificial process was commenced, certain it is, that, in direct violation of the laws of constitution and relation, which the Creator has established in the nature of man, (§ 1322.) this process of mechanical analysis is, at the present day, carried to the full extent of possibility; and the farina and gluten and saccharine matter of the wheat, are almost perfectly concentrated in the form of superfine flour. Nor is this all—these concentrated nutrient properties of the wheat are mixed and complicated in ways innumerable, with other concentrated substances, to pamper the depraved appetites of man, with kinds of food which always and inevitably tend to impair his health and to abbreviate his life. (§ 1323.)—Even the bread, which is the simplest form into which human ingenuity tortures the flour of wheat, is, by other causes besides the concentration I have named, too frequently rendered the instrument of disease and death, rather than the means of life and health, to those that eat it.

§ 1350. In cities and large towns, most people depend on public bakers for their bread. And I have no doubt that public bakers, as a body, are as honest and worthy a class of men as any in society. I have no wish to speak evil of any one; and it is always painful to me to find myself compelled, in fidelity to the common cause of humanity, to expose the faults of any particular class of men, when probably every other class in society is as deeply involved in errors which, in the sight of God, evince, at least, an equal degree of moral turpitude. But public bakers, like other men, who serve the public more for the sake of securing their own emolument than for the public good, have always had recourse to various expedients in order to increase the lucrativeness of their business. To secure custom and profit at the same time,

they have considered it necessary, that a given quantity of flour should be made into a loaf as large and as white as possible, and free from any disagreeable taste, while at the same time it retains the greatest possible weight.

§ 1351. From a variety of causes, the quality and price of flour have always been very unstable. Sometimes the crops are small, or the foreign demand for flour, or the home consumption is unusually great, or the season is unfavorable to the health of grain, and the wheat becomes diseased, or the harvest time is unfavorable and the wheat sprouts before it is secured, or large quantities of flour become soured or musty, or in some other manner damaged.—To counteract these things, and to make the most profitable use of such flour as the market affords them, the public bakers have been led to try various experiments with chemical agents, and there is reason to believe that in numerous instances, they have been too successful in their practices, for the well-being of those who have been the consumers of their bread.

§ 1352. According to treatises on bread-making, which have within a few years past, appeared in European scientific journals, “alum, sulphate of zinc, sub-carbonate of magnesia, sub-corbonate of ammonia, sulphate of copper, and several other substances, have been used by public bakers in making bread; and some of these substances have been employed by them to a very great extent, and with very great success in the cause of their cupidity. They have not only succeeded by such means, in making light and white bread out of extremely poor flour, but they have also, been able so to disguise their adulterations, as to work in with their flour, without being detected by the consumers, a portion of the flour of beans, peas and potatoes: —and even chalk, pipe clay and plaster of Paris, have been employed to increase the weight and whiteness of

their bread." "The use of alum in bread-making," says a distinguished chemist, "appears to be very ancient. It is one of those articles which have been the most extensively and successfully used in disguising bad flour, and the various adulterations of bread. Its injurious action upon the health is not to be compared with that of sulphate of copper, and yet, daily taken into the stomach, it may seriously affect the system."

§ 1353. "Thirteen bakers were condemned on the 27th of January, 1829, by the correctional tribunal of Brussels, for mixing sulphate of copper or blue vitriol with their bread. It makes the bread very white, light, large and porous, but rather tasteless; and it also enables the bread to retain a greater quantity of water, and thereby very considerably increases its weight. A much larger quantity of alum is necessary to produce these effects; but when of sufficient quantity, it strengthens the paste, and, as the bakers say, 'makes the bread swell large.' "—If the statements of our large druggists can be relied on, the public bakers of our own country probably employ animonia more freely, at present, than any other substance I have named. Pearlash or saleratus is also used by them in considerable quantities.

§ 1354. But even where these adulterations are not practised, the bakers' bread is very rarely a wholesome article of diet.—If any dependence is to be placed on the testimony of several of the principal bakers and flour merchants in New York, Boston and other cities, the flour which most of our public bakers work into bread, is of a very inferior quality to what is called good "family flour," and for which they pay from one to three dollars less per barrel; and they sometimes purchase large quantities of old spoiled flour from New Orleans and elsewhere, which has heated and soured in the barrel, and perhaps

become almost as solid as a mass of chalk; so that they are obliged to break it up, and grind it over, and spread it out, and expose it to the air, in order to purify it in a measure from its acid and other bad properties: and then they mix it with a portion of much better flour; and from this mixture they can make, as they say, the very largest and finest looking loaf.* But should the public bakers always use the best of flour, their bread, as a general statement, would still be very inferior to well made domestic bread, in point of sweetness and wholesomeness. Their mode of manufacturing bread—to say the least of it—destroys much of the virtue of the flour or meal; and hence their bread is only palatable—even to those who are accustomed to it—within twelve, or at the longest, twenty-four hours after it is baked.

Bread made of Unbolted Meal, most wholesome.

§ 1355. Whether our bread is of domestic manufacture or made by the public baker, that which is made of superfine flour is always far less wholesome, in any and every situation of life, than that which is made of wheaten meal which contains all the natural properties of the grain. (§ 754.—761.) It is true, that when much flesh is eaten with our bread, or when bread constitutes but a very small and unimportant portion of our food, the injurious effects of superfine flour bread are not always so immediately and distinctly perceived as in other cases.

* An aged and very respectable member of the Society of Friends, in New York, who had long been extensively engaged in the flour business in that city, and who had always had his family bread made in his own house, was one day asked by his daughter, why he never used the bakers' bread:—"Because, my child," replied he, "I know what it is made of."

Nevertheless, it is a general and invariable law of our nature, that all concentrated forms of food are unfriendly to the physiological or vital interests of our bodies. (§ 749.) We have seen (§ 520.) that a very large proportion of all the diseases and ailments in civic life, are originated by causes which are introduced into the alimentary canal as articles of diet; and disturbance and derangement of function,—obstructions, debility and irritations, are among the most important elements of those diseases. And it is, probably speaking within bounds, to say that nine tenths of the adults, and nearly as large a proportion of youth in civic life, are more or less afflicted with obstructions and disturbances in the stomach and bowels and other organs of the abdomen, the symptoms of which are either habitual costiveness or diarrhœa, or an alternation of both; or frequent and severe attacks of what are called bilious colics, &c. &c., and in children and youth, worms, fits, convulsions, &c. And I cannot but feel confident, that the use of superfine flour bread is among the important causes of these and numerous other difficulties. I have indeed, been surprised to observe that, in the hundreds of cases of chronic diseases of every form and name, which have come to my knowledge within the last six or eight years, costiveness of the bowels has in almost every instance been among the first and most important symptoms. And I have never known this difficulty, even after an obstinate continuance of five, ten, twenty or thirty years, fail to disappear in a short time, after the coarse wheaten bread of a proper character has been substituted for that made of superfine flour.

§ 1356. Some physicians and other individuals, without properly examining the subject, have raised several objections against the coarse wheaten bread. It is said, in the first place, that bran is wholly indigestible, and

therefore, should never be taken into the human stomach.—This objection betrays so much ignorance of the final causes and constitutional laws, clearly indicated by the anatomical structure and physiological economy of the alimentary organs, that it scarcely deserves the slightest notice. (§ 438.) If the digestive organs of man were designed to receive nothing but digestible and nutrient substances, they would have been constructed and arranged very differently from what they are. As we have fully seen, (§ 747.) every thing which nature provides for our sustenance, consists of certain proportions of nutritious and innutritious matter: and a due proportion of innutritious matter in our food is as essential to the health and functional integrity of our alimentary organs, as a due proportion of nutritious matter is to the sustenance of the body. (§ 1322.)

§ 1357. Another objection is, that, although bran may serve, like other mechanical irritants and excitants, for a while, to relieve constipation, yet it soon wears out the excitability of the organs, and leaves them more inactive than before.—Here again, a false statement is urged by inexcusable ignorance; for it is not true that the bran acts in the manner supposed in this objection; nor are the effects here asserted ever produced by it. It is true, however, that the very pernicious habits of some people, who use the coarse wheaten bread, entirely counteract the aperient effects of the bread; and it is true that others, depending wholly on the virtues of this bread for peristaltic action, and neglecting all exercise, by their extreme inertness, and indolence, and *over-eating*, bring on a sluggishness and debility and constipation of the bowels, and perhaps become severely afflicted with piles, in spite of the natural fitness of the bread to promote regular peristaltic action, and to prevent all these results.

§ 1358. A third objection is, that, though the coarse

wheaten bread may do very well for those who are troubled with constipation, by mechanically irritating and exciting the stomach and bowels, yet for that very reason it is wholly unfit and improper for those who are afflicted with chronic diarrhoea.—Here is still another objection founded in ignorance of the true physiological and pathological principles which it involves. The truth is that, the coarse wheaten bread, under a proper general regimen, is as excellent and sure a remedy for chronic diarrhoea as for chronic constipation. I have seen cases of chronic diarrhoea of the most obstinate character, and which had baffled the highest medical skill and every mode of treatment for more than twenty years, yielding entirely, under a proper general regimen, in which this bread was the almost exclusive article of food, and not a particle of medicine was used. And, excepting in cases where the complaint was symptomatic of some incurable organic disease,* I have never known such a mode of treatment to fail of wholly relieving diarrhoea, whether recent or chronic, although a very great number of cases have come under my notice.

§ 1359. It is fully evident therefore, that the bran does not act on the digestive organs as a mere mechanical irritant; for if it did, it would always necessarily aggravate, rather than alleviate diarrhoea. Nor does it relieve diarrhoea on the principle of a narcotic nor of a stimulant; for the effect of these is always to give an immediate check to that complaint; and in such a manner as to expose the system to a return of it. But the coarse wheaten bread *seems* to increase the disease for a short time, at first, and then gradually restores the healthy condition and action of the bowels. The mucilage of wheat bran

* Even in cases of this kind the distressing symptoms are always mitigated by the use of the coarse wheaten bread.

is probably one of the most soothing substances in the vegetable kingdom, that can be applied to the mucous membrane of the stomach and bowels.

§ 1360. Chronic constipation and chronic diarrhoea, both spring from the same root. Where the constitutional vigor of the alimentary canal is very considerable, continued irritations, resulting in debility, will produce constipation; and these continued causes operating for some time, will often induce such a state of debility and irritability as is attended with diarrhoea:—and in other cases, when this constitutional vigor of the alimentary canal is much less, diarrhoea is far more readily induced, and rendered chronic.

§ 1361. Coarse wheaten bread then, by its adaptation to the anatomical structure and to the physiological properties and functional powers of our organs, (§ 1322.) serves to prevent and to remove the disorders and diseases of our bodies, only by preventing and removing irritation and morbid action and condition, and thereby affording the system an opportunity of recovering its healthy and vigorous action and condition. And the thousands of individuals in our own country of every age—of both sexes—of all situations, conditions and circumstances, who within the last eight years have been benefited by using the coarse wheaten bread, instead of that made of superfine flour, are living witnesses of the virtues of that bread.

§ 1362. But the testimony in favor of coarse wheaten bread as an important article in the food of man, is by no means limited to our own country nor to modern times. In all probability, as we have already seen, (§ 1332.) the first generations of our species, who became acquainted with the art of making bread, continued for many centuries to employ all the substance of

the grain, which they coarsely mashed in their rude mortars or mills. And even since mankind began, by artificial means, to separate the bran from the flour, and to make bread from the latter, the more close and discerning observers among physicians and philanthropists, have perceived and asserted, that bread made of fine flour is decidedly less wholesome than that made of the unbolted wheat meal.—Hippocrates, styled the father of medicine, who flourished more than two thousand years ago, and who depended far more on a correct diet and general regimen, both for the prevention and removal of disease, than he did on medicine, particularly commended the unbolted wheat-meal bread, “for its salutary effects upon the bowels.” It was a fact well understood by the ancients, that this bread was much more conducive to the general health and vigor of their bodies, and every way better adapted to nourish and sustain them than that made of the fine flour. And accordingly, their wrestlers and others who were trained for great bodily power, “ate only the coarse wheaten bread, to preserve them in their strength of limbs.” The Spartans were famous for this kind of bread; and we learn from Pliny that the Romans, as a nation, at that period of their history when they were the most remarkable for bodily vigor and personal prowess and achievement, knew no other bread for three hundred years. The warlike and powerful nations which overran the Roman Empire, and finally spread over the greater part of Europe, used no other kind of bread than that which was made of the whole substance of the grain; and from the fall of the Roman Empire to the present day, a large proportion of the inhabitants of all Europe and the greater part of Asia, have rarely used any other kind of bread.

§ 1363. “If you set any value on health, and have a

mind to preserve nature,"—said Thomas Tryon, student in physic, in his " Way to Health, Long Life and Happiness," published in London, in the latter part of the fifteenth century,—“ you must not separate the finest from the coarsest flour: because that which is fine is naturally of an obstructive and stopping quality; but, on the contrary, the other, which is coarse, is of a cleansing and opening nature, therefore the bread is best which is made of both together. It is more wholesome, easier of digestion, and more strengthening than bread made of the finest flour. It must be confessed, that the nutritive quality is contained in the fine flour; yet, in the branny part is contained the opening and digestive quality; and there is as great a necessity for the one as the other, for the support of health: that which is accounted the worst is as good and beneficial to nature as the best; for when the finest flour is separated from the coarsest and branny parts, neither the one nor the other has the true operations of the wheat meal. The eating of fine bread, therefore, is inimical to health, and contrary both to nature and reason, and was at first invented to gratify *wanton* and *luxurious* persons, who are ignorant both of themselves, and the true virtue and efficacy of natural things.”—“ Baron Steuben has often told me,” says Judge Peters, “ that the peculiar healthfulness of the Prussian soldiers, was in a great measure to be attributed to their ammunition bread, made of grain, triturated or ground, but not bolted; which was accounted the most wholesome and nutritious part of their rations.”—“ The Dutch sailors, in the days of their naval glory, were supplied with the same kind of bread.”

§ 1364. “ During the war between England and France, near the close of the last century,” says Mr. Samuel Prior, a respectable merchant of Salem, New

Jersey—"the crops of grain, and particularly wheat, were very small in England, and the supplies from Dantzic, the Netherlands, and Sweden being cut off by the French army, and also, the usual supplies from America failing, there was a very great scarcity of wheat in England. The British army was then very extensive, and it was exceedingly difficult to procure provisions for it, both at home and abroad—on land and sea. Such was the demand for the foreign army, and such the deficiency of crops at home and supplies from abroad, that serious fears were entertained that the army would suffer, and that the continental enterprise of the British government would be defeated in consequence of the scarcity of provisions; and every prudential measure by which such a disastrous event could be prevented, was carefully considered and proposed. William Pitt was then prime minister of state, and at his instance, government recommended to the people generally throughout Great Britain, to substitute potatoes and rice as far as possible, for bread, in order to save the wheat for the foreign army. This recommendation was promptly complied with by many of the people. But still the scarcity was alarmingly great. In this emergency, parliament passed a law (to take effect for two years) that the army at home should be supplied with bread made of unbolted wheat meal, solely for the purpose of making the wheat go as far as possible, and thus saving as much as they could from the home consumption, for the better supply of the army on the continent. Eighty thousand men were quartered in barracks in the counties of Essex and Suffolk. A great many were also quartered throughout the towns, at taverns, in squads of thirty or forty in a place. Throughout the whole of Great Britain, the soldiers were supplied with this coarse bread. It was deposited in

the store rooms with the other provisions of the army on the day that it was baked, and at nine o'clock the next morning, was distributed to the soldiers, who were at first exceedingly displeased with the bread, and refused to eat it, often casting it from them with great rage, and violent execrations. But after two or three weeks they began to be much pleased with it, and preferred it to the fine flour bread."

§ 1365. "My father," continues Mr. P., "whom I have often heard talk these things over, was a miller and a baker, and resided in the county of Essex, on the border joining Suffolk, and near the barracks containing the eighty thousand soldiers. He contracted with government, to supply the eastern district of the county of Essex, with the kind of bread I have mentioned: and he used always to send me with it to the depositories on the day it was baked: and though I was then a youth, I can still very distinctly remember the angry looks and remarks of the soldiers, when they were first supplied with it. Indeed, they often threw their loaves at me as I passed along, and accompanied them with a volley of curses.—The result of this experiment was, that not only the wheat was made to go much farther, but the health of the soldiers improved so much and so manifestly, in the course of a few months, that it became a matter of common remark among themselves, and of observation and surprise among the officers and physicians of the army. These gentlemen at length came out with confidence and zeal on the subject, and publicly declared that the soldiers were never before so healthy and robust; and that disease of every kind had almost entirely disappeared from the army. The public papers, were for months, filled with recommendations of this bread, and the civic physicians almost universally throughout Great Britain, pronounced it far the

most healthy bread that could be eaten, and as such, recommended it to all the people, who very extensively followed the advice:—and the coarse wheaten bread was very generally introduced into families, female boarding schools, and indeed, all public institutions. The nobility also, generally used it; and in fact, in many towns, it was a rare thing to meet with a piece of fine flour bread. The physicians generally asserted that this wheaten bread was the very best thing that could be taken into the human stomach, to promote digestion and peristaltic action; and that it, more than any thing else, would assist the stomach in digesting other things which were less easily digested, and therefore they recommended that a portion of it should be eaten at every meal with other food. Still, after this extensive experiment had been made with such happy results, and after so general and full a testimony had been given in favor of the coarse wheaten bread, when large supplies of superfine flour came in from America, and the crops at home were abundant, and the act of parliament in relation to the army became extinct, most of the people who had before been accustomed to the use of fine flour bread, now by degrees returned again to their old habits of eating fine bread. Many of the nobility, however, continued to use the coarse bread for a number of years afterwards. General Hanoward, Squire Western, Squire Hanbury and others living near my father's continued to use the bread for a long time, and some of them still used it when I left home and came to America, in 1816."

§ 1366. The testimony of sea captains and old whalers is equally in favor of wheaten bread. (§ 755.) "I have always found," said a very intelligent sea captain of more than thirty years' experience, "that the coarser my ship bread, the healthier my crew is." A writer in Rees'

Cyclopædia, (article Bread,) says—"The inhabitants of Westphalia, who are a hardy and robust people, and capable of enduring the greatest fatigues, are a living testimony to the salutary effects of this sort of bread; and it is remarkable that they are very seldom attacked by acute fevers, and those other diseases which are from bad humors." In short, as I have already stated, (§ 1337.) the bread of a large portion of the laboring class, or peasantry, throughout Europe, Asia and Africa, and the islands of the ocean; whether leavened or unleavened—whether more or less artificially prepared, is made of the whole substance of the grain from which it is manufactured: and no one who is sufficiently enlightened in physiological science to qualify him to judge correctly in this matter, can doubt that bread made in the best manner from unbolted wheat meal, is far better adapted to the anatomical structure and physiological powers of the alimentary organs of man, than bread made of superfine wheat flour; and consequently, the former is far more conducive to the health and vigor and general well-being of man than the latter.

§ 1367. If therefore, mankind will have raised bread which in every respect most perfectly conforms to the laws of constitution and relation established in their nature, (§ 1322.) and is most highly conducive to the welfare of their bodies and souls, then must it be well made, well baked, light and sweet bread, which contains all the natural properties of the wheat. And if they will have this bread of the very best, and most wholesome kind, they must, as I have already stated, see that the soil from which their wheat is raised, is of a proper character, and is properly tilled,—that the wheat is plump—full-grown—ripe, and free from rust and other diseases; and then, before it is ground, they must see that it is thoroughly

cleansed, not only from chaff, cockles, tares, and such like substances, but also from all smut, and every kind of impurity that may be attached to the skin of the kernel. And let every one be assured that this is a matter which really deserves all the attention and care that I suggest. If human existence is worth possessing, it is worth preserving; and they who have enjoyed it as some have done, and as all the human family are naturally endowed with the capabilities to enjoy it, certainly will not doubt whether it is worth possessing; nor, if they will properly consider the matter, can they doubt that its preservation is worthy of their most serious and diligent care. And when they perceive how intimately and closely the character of their bread is connected with the dearest interests of man, they will not be inclined to feel that any reasonable amount of care and labor is too much to be given to secure precisely the right kind of bread.

§ 1368. I repeat then, that they who would have the very best bread, should certainly wash their wheat, and cleanse it thoroughly from all impurities, before they take it to the mill; and when it is properly dried, it should be ground by sharp stones which will cut rather than mash it: and particular care should be taken that it is not ground too fine. Coarsely ground wheat meal, even when the bran is retained, makes decidedly sweeter and more wholesome bread than very finely ground meal.—When the meal is ground, it should immediately be spread out to cool before it is put into sacks or casks:—for if it is packed or enclosed in a heated state, it will be far more likely to become sour and musty. And I say again, where families are in circumstances to do wholly as they choose in the matter, it is best to have but little ground at a time: as the freshly ground meal is

always the liveliest and sweetest, and makes the most delicious bread.

§ 1369. When the meal is thus prepared and brought home, whether in a barrel or sack, the next thing to be attended to, is that, it be placed and kept in a perfectly clean and sweet and well ventilated meal room. It should on no consideration be put into a closet, or pantry, or store-room, which is seldom aired, and more rarely cleansed; and into which all manner of rubbish is thrown, or even where other kinds of provisions are kept. If the meal be put into a pantry or store-room which is confined and dirty, and into which old boots and shoes, and old clothes and pieces of carpet, and other things of this kind, are thrown, or where portions of vegetable or animal substance, whether cooked or uncooked, are habitually or even occasionally put and permitted to remain, it must be expected, as a matter of course—of necessity, that the quality of the meal will be considerably deteriorated by the impurities with which the air of the place will be loaded, and which will be continually generated there. People generally have but a sorry idea of what constitutes true cleanliness; but they may be assured that they cannot be too deeply impressed with the importance of keeping their meal room as clean and sweet and well-aired as possible.

Properties of Meal—Yeast—Fermentation.

§ 1370. According to the statement of Professor Thomson, of Edinburgh, one pound of good wheat meal contains ten ounces of farina or starch, three ounces of bran, six drams of gluten and two drams of sugar;—and it is because wheat contains such proportions of these substances that it makes the very best loaf bread. The

farina or starch is the principal nourishing property;—the saccharine matter or sugar is also highly nutrient; but in the process of making loaf bread, it serves mainly, by its vinous fermentation, to produce the gas or air by which the dough is raised and the bread made light. The gluten is likewise a very nutrient property, but in loaf bread, it principally serves, by its cohesiveness, like gum elastic, or India rubber, to prevent the gas or air formed by the fermentation of the sugar, from escaping or passing off;—and the gas being thus retained, inflates or puffs up the dough, and makes it porous and light. The bran, with its mucilaginous and other properties, not only adds to the nutritiousness of the bread, but eminently serves to increase its digestibility, and to invigorate the digestive organs, and preserve the general integrity of their functions.

§ 1371. The next thing indispensably necessary to the making of good loaf bread, is good, lively, sweet yeast, or leaven, to produce what is called the panary, or more properly, the vinous fermentation of the saccharine matter, or sugar.—Some bread-makers will do best with one kind of yeast or leaven, and some with another. I have generally found that people do best with those materials to which they have been most accustomed; but I am sorry to find so general a dependence on breweries for yeast. To say nothing of the impure and poisonous substances which brewers employ in the manufacture of beer, and which always affect the quality of their yeast, I am confident that domestic yeast can be made of a far superior quality. However light and good in other respects that bread may be which is made with brewers' yeast, I have rarely if ever seen any, in which I could not at once detect the disagreeable properties of the yeast.—There are various ways of making domestic yeast. One of the simplest, and perhaps the best, is the following, which was

communicated to me by one of the best bread-makers I ever saw:—"Put into one gallon of water a double handful of hops;—boil them fifteen or twenty minutes, then strain off the water while it is scalding hot;—stir in wheat flour or meal till it becomes a thick batter, so that it will hardly pour;—let it stand till it becomes about blood warm, then add a pint of good lively yeast, and stir it well; and then let it stand in a place where it will be kept at a temperature of about seventy degrees Fah. till it becomes perfectly light,—whether more or less time is required; and then it is fit for use.—Or if it is desired to keep a portion of it, let it stand several hours and become cool; and then put it into a clean jug and cork it tight, and place it in the cellar where it will keep cool; and it may be preserved good, ten or twelve days, and even longer." Another way by which yeast when thus made may be preserved much longer, and perhaps more conveniently, is, to take it when it has become perfectly light, and stir in good Indian meal until it becomes a hard dough: then take this dough and make it into small thin cakes, and dry them perfectly, without baking or cooking them at all. These cakes, if kept perfectly dry, will be good for several weeks and even months. When yeast is needed, take some of these cakes (more or less according to the quantity of bread desired) and break them fine and dissolve them in warm water, and then stir in some wheat flour till a batter is formed, which should be kept at a temperature of about sixty degrees Fah. till the yeast becomes light and lively, and fitted for making bread. Others, in making this yeast, originally put into the water with the hops, a double handful of good clean wheat bran, and boil them up together and strain off the water as above described: others again, boil up a quantity of wheat bran without the hops, and make their yeast in all other respects as above described.

§ 1372. The milk yeast is greatly preferred by many; and when it is well managed, it certainly makes very handsome bread. The way of making it is simple. Take a quart of milk fresh from the cow, (more or less according to the quantity of bread desired,)—a little salt is generally added, and some add about half a pint of water blood warm, but this is not essential;—then stir wheat flour or meal into the milk till it forms a moderately thick batter; and then cover it over, and place it where it will remain at a temperature of from sixty to seventy degrees Fah. till it becomes perfectly light. It should then be used immediately: and let it be remembered that dough made with this yeast will sour sooner than that made with other yeast; and also that the bread after it is baked will become extremely dry and *crumbly* much sooner than bread made with other yeast. Yet this bread, when a day old, is exceedingly light and beautiful: albeit some dislike the animal smell and taste which it derives from the milk.

§ 1373. In all these preparations of yeast and dough, it should ever be recollected that “the process of fermentation cannot go on when the temperature is below thirty degrees Fah., that it proceeds quite slowly at fifty degrees, moderately at sixty degrees, rapidly at seventy degrees, and very rapidly at eighty degrees.”—If therefore, it is desired to have the yeast or dough stand several hours before it is used or baked, it should be kept at a temperature of about fifty degrees. But in the ordinary way of making bread, a temperature varying from sixty degrees to seventy degrees, or about summer heat, is perhaps as near right as it can well be made.

§ 1374. Professor Thomson gives the following directions for making yeast in large quantities:—“Add ten pounds of flour to two gallons of boiling water;—stir it

well into a paste, let this mixture stand for seven hours, and then add about a quart of good yeast. In about six or eight hours, this mixture, if kept in a warm place, will have fermented and produced as much yeast as will make 120 quartern loaves" (of 4 lbs. each.) A much smaller quantity can be made by observing due proportions of the ingredients.—To raise bread in a very short time without yeast, he gives the following recipe:—"Dissolve in water 2 ounces, 5 drams and 45 grains of common crystallized carbonate of soda, and mix the solution well with your dough, and then add 7 ounces, 2 drams and 22 grains of muriatic acid of the specific gravity of 1.121, and knead it as rapidly as possible with your dough;—it will rise immediately—fully as much, if not more than dough mixed with yeast—and when baked, will be a very light and excellent bread." Smaller quantities would be required for small batches of bread. A tea-spoonful or more (according to the quantity of dough or batter) of super-carbonate of soda dissolved in water, and flour stirred in till it becomes a batter, and then an equal quantity of tartaric acid dissolved and stirred in thoroughly, will in a few minutes make very light batter for griddle or pancakes; or if it be mixed into a thick dough, it will make light bread. Good lively yeast however, makes better bread than these alkalies and acids: howbeit these are very convenient in emergencies, when bread or cakes must be prepared in a very short time; or when the yeast has proved inefficient.

§ 1375. We see then (§ 1370.) that wheat meal consists of certain proportions of starch, gluten, sugar, bran, &c.; and that in making loaf bread, we add yeast or leaven, in order to produce that kind of fermentation peculiar to saccharine matter or sugar, which is called vinous, and by which the gas or air is formed that raises

the dough. But the sugar is an incorporate part of every particle of the meal, and is therefore equally diffused throughout the whole mass; and hence if we would make the very best loaf bread, the fermentive principle or yeast must also be equally diffused throughout the whole mass, so that a suitable portion of yeast will be brought to act at the same time on every particle of saccharine matter in the mass.—But let us endeavor to understand this process of fermentation. To speak in the language of chemistry, sugar is composed of certain proportions of carbon, oxygen and hydrogen. The yeast, acting on the sugar, overcomes those affinities by which these substances are held in the constitutional arrangement of sugar, and the process of decay or decomposition of the sugar takes place, which is called vinous fermentation. By this process of decay, two other forms of matter are produced, of an essentially different nature from each other and from the sugar. One of them is called carbonic acid gas or air, being formed by a chemical combination of certain proportions of carbon and oxygen. The other is known by the name of alcohol, and consists of a chemical combination of certain proportions of carbon, oxygen, and hydrogen. Carbonic acid gas, as we have seen, (§ 143.) is also produced by animal respiration or breathing, by the combustion of wood, coal, &c. &c., and in other ways of nature and of art: but neither in nature nor in art, is there any known way by which alcohol can be produced, except by that process of the decay or destruction of sugar called vinous fermentation. The carbonic acid gas, produced in the manner I have stated, is the air which inflates or puffs up and swells out the bread, when there is sufficient gluten or other cohesive matter in the dough to prevent its escape. If the dough be permitted to stand too long

in a warm place, the fermentation, having destroyed most or all of the sugar, will begin to act on the starch and mucilage, and destroy their nature, and produce vinegar; and therefore, this stage of it is called the acetous fermentation; and if it still be permitted to go on, it will next commence its work of destruction on the gluten; and this is called the putrefactive fermentation, because it in many respects resembles the putrefaction of animal matter.

§ 1376. The vinous fermentation, therefore, by which the dough is raised and made light, may be carried to all necessary extent, and still be limited in its action to the saccharine matter or sugar—leaving the starch and gluten, and other properties of the meal, uninjured; and this is the point at which the fermentation should be arrested by the heat that bakes the dough. If it be permitted to go beyond the sugar, and act on the mucilage and starch, and produce acidity, the excellence of the bread is in some degree irreparably destroyed. The acid may be neutralized by pearlash or soda, so that the bread shall not be sour; but still, something of the natural flavor of the bread is gone, and it is not possible by any earthly means to restore it; and this injury will always be in proportion to the extent to which the process of the acetous fermentation is permitted to go in destroying the nature of the starch, and the bread will be proportionably destitute of that natural sweetness and delicious richness essential to good bread. Yet it is almost universally true, both in public and domestic bread-making, that the acetous fermentation is allowed to take place; and saleratus, or soda, or some other chemical agent is employed to neutralize the acid. By this means, we may have bread free from acidity, it is true, but it is also destitute of the best and most delicious properties of good bread;

and generally, by the time it is twenty-four hours old—and this is particularly true of bakers' bread—it is as dry and tasteless and unsavory as if it were made of plaster of Paris. Many bread-makers mix their saleratus or soda with their yeast, or introduce it when they mix their dough, so that if the acetous fermentation does take place, the acid is neutralized by the alkali, and therefore, not being perceived, it is supposed never to have existed, and the bread is called sweet and good; especially if a small quantity of molasses be employed in making the dough. Others far more wisely withhold their alkali till the dough is raised enough to mould into the loaf, and then if it is found to be in any degree acid, a solution of saleratus or soda is worked into it, so as just to neutralize the acid, and no more. This is infinitely better than to have sour bread, which, after all, is almost everywhere met with; yet the very best bread that can be made in this way is only second best. Happy are they who can make good, light and sweet bread, without the use of molasses—without suffering the least degree of acetous fermentation to take place, and without employing saleratus, soda, or any other kind of alkali.

§ 1377. The third or putrefactive stage of fermentation rarely takes place in domestic bread-making; but it is by no means uncommon in public bakeries. Indeed, it is thought necessary in the manufacture of certain kinds of crackers, in order to make them split open, and render them brittle, and cause them readily to become soft when dipped into water. But dyspepsy crackers, and all other kinds of bread made in this way are, to say the least of them, miserable stuff. For besides the fact that all the best qualities of the flour or meal have been destroyed by fermentation, the great quantity of alkali employed in

neutralizing the acid, is necessarily injurious to the digestive organs.

Mixing, kneading and baking Bread.

§ 1378. Now then, the business of the bread-maker is to take the wheat meal, prepared in the manner I have stated, and with all the properties I have described, (§ 1370.) and convert it into good, light, sweet, well-baked bread, with the least possible change in those properties; so that the bread, when done, will present to the senses of smell and taste, all the delicious flavor and delicate sweetness which pure organs perceive in the meal of good new wheat, just taken from the ear and ground, or chewed without grinding; and it should be so baked that it will, as a general rule, require and secure a full exercise of the teeth in mastication. (§ 719.)

§ 1379. Take then, such a quantity of meal, in a perfectly clean and sweet bread trough, as is necessary for the quantity of bread desired, and having made a hollow in the centre, turn in as much yeast as a judgment matured by sound experience shall deem requisite; then add such a quantity of water, milk and water, or clear milk, as is necessary to form the meal into a dough of proper consistency. Some prefer bread mixed with water alone; others prefer that which is mixed with milk and water; and others think that bread mixed with good milk is much richer and better; while others dislike the animal odor and taste of bread mixed with milk. Perhaps the very best and most wholesome bread is that which is mixed with pure soft water, when such bread is made perfect. But whether, water, milk and water, or milk alone is employed, it should be used at a temperature of about blood heat.

§ 1380. Here let it be understood, that the starch of the meal is of such a nature that, by a delicate process peculiar to itself, it becomes changed into sugar or saccharine matter; and when the fluid used in mixing the dough is of a proper temperature, and the dough is properly mixed and kneaded, this process, to some small extent takes place, and a small portion of the starch is actually converted into sugar, and thereby increases the sweetness of the bread. Let it also be recollected here, that the saccharine matter on which the yeast is to act, is equally diffused throughout the whole mass of the meal, (§ 1375.) and therefore, if the yeast be not properly diffused throughout the whole mass, but is unequally distributed, so that an undue quantity of it remains in one part, while other parts receive little or none, then the fermentation will go on very rapidly in some parts of the mass, and soon run into the acetous state, while in other parts it will proceed very slowly or not at all; and consequently, large cavities will be formed in some parts of the dough, while other parts of it will remain as compact and heavy as when first mixed, and sometimes even more so. I need not say that such dough cannot be made into good bread; yet it is probably true, that more than nine tenths of the bread consumed in this country, is more or less of this character. Nor, after what I have said, should it seem necessary for me to remark, that good bread cannot be made by merely stirring the meal and yeast and water or milk together into a thin dough or sponge, and suffering it to ferment with little or no working or kneading. Bread made in this manner, if it is not full of cavities large enough for a mouse to burrow in, surrounded by parts as solid as lead, is almost invariably full of cells of the size of large peas and grapes; and the substance of the bread has a shining, glutinous appear-

ance; and if the bread is not sour, it is because pearlash or some other kind of alkali has been used to destroy the acid.—The very appearance of such bread is forbidding, and shows, at a glance, that it has not been properly mixed,—that the yeast has acted unequally on different portions of the meal, and that the fermentation has not been of the right kind.

§ 1381. But if the yeast be so diffused throughout the whole mass, as that a suitable portion of it will act on each and every particle of the saccharine matter at the same time, and if the dough be of such a consistency and temperature as not to admit of too rapid a fermentation, then each minute portion of saccharine matter throughout the whole mass, will, in the process of fermentation, produce its little volume of air, which will form its little cell, about the size of a pin's head, and smaller; and this will take place so nearly at the same time, in every part of the dough, that the whole will be raised and made as light as a sponge, before the acetous fermentation takes place in any part. And then, if it be properly moulded and baked, it will make the most beautiful and delicious bread—perfectly light and sweet, without the use of any alkali, and with all the gluten and nearly all the starch of the meal remaining unchanged by fermentation.

§ 1382. Who that can look back thirty or forty years to those blessed days of New England's prosperity and happiness, when our good mothers used to make the family bread, but can well remember how long and how patiently those excellent matrons stood over their bread troughs, kneading and moulding their dough? and who with such recollections cannot also well remember the delicious bread that those mothers used invariably to set before them? There was a natural sweetness and richness in it which made it always desirable; and which we cannot

now vividly recollect, without feeling a strong desire to partake again of such bread as our mothers made for us in the days of our childhood.

§ 1383. Let it be borne in mind then, that without a very thorough kneading of the dough, there can be no just ground of confidence that the bread will be good. "It should be kneaded," says one of much experience in this matter, "till it becomes flaky." Indeed, I am confident that our loaf bread would be greatly improved in all its qualities, if the dough were for a considerable time subjected to the operations of the machine which the bakers call the break, used in making crackers and sea bread.

§ 1384. The wheat meal, and especially if it is ground coarsely, swells considerably in the dough, and therefore the dough should not, at first, be made quite so stiff, as that made of superfine flour; and when it is raised, if it is found too soft to mould well, let a little more meal be added.

§ 1385. When the dough has been properly mixed and thoroughly kneaded, cover it over with a clean napkin or towel, and a light woollen blanket kept for the purpose, and place the bread trough where the temperature will be kept at about sixty degrees Fah. or about summer heat, and there let it remain till the dough becomes light. But, as it is impossible to regulate the quantity and quality of your yeast, the moisture and temperature of your dough, and several other conditions and circumstances, so as to secure at all times precisely the same results in the same time, it is therefore necessary that careful attention should be given that the proper moment should be seized to work over and mould the dough into the loaf, and get it into the oven just at the time when it is as light as it can be made by the vinous fermentation, and before

the acetous fermentation commences. If however, by any means, there should unfortunately be a little acidity in the dough, take a small quantity of saleratus, or, what is better, carbonate of soda, and dissolve it in some warm water, and carefully work in just enough to neutralize the acid. The best bread-makers are so exceedingly careful on this point, that they dip their fingers into the solution of saleratus or soda, and thrust them into the dough in every part, as they work it over, so as to be sure that they get in just enough to neutralize the acid, and not a particle more. But I must here repeat, that they who would have the very best of bread, must always consider it a cause of regret, that there should be any necessity to use alkali; because the acetous fermentation cannot in any degree take place, without commensurately and irremediably impairing the quality of the bread. And here it should be remarked, that dough made of wheat meal will take on the acetous fermentation, or become sour, sooner than that made of fine flour. This is probably owing principally to the mucilage contained in the bran, which runs into the acetous fermentation sooner than starch.

§ 1386. While the dough is rising, preparations should be made for baking it. Some bake their bread in a brick oven, some in a stove, some in a reflector, and some in a baking kettle. In all these ways very good bread may be baked; but the baking kettle is decidedly the most objectionable. Probably there is no better and more certain way of baking bread well than in the use of the brick oven. Good bread-makers, accustomed to brick ovens, can always manage them with a very great degree of certainty; and as a general fact, bread is sweeter, baked in this way, than in any other. Yet, when it is well baked in tin reflectors, it is certainly very fine; and so it is also

when well baked in iron stoves. But the baking of bread requires almost as much care and judgment as any part of the process of bread-making. If the oven is too hot, the bread will burn on the outside before it is done in the centre; if it is too cold, the bread will be heavy, raw and sour. If the heat is much greater from below than from above, the bottom of the loaf will burn before the top is done: or if the heat is much greater from above than from below, the top of the loaf will burn before the bottom is done. All these points therefore must be carefully attended to; and no small excuse ought to be considered a satisfactory apology for sour, heavy, raw or burnt bread; for it is hardly possible to conceive of an absolute necessity for such results; and the cases are extremely rare in which they are not the offspring of downright and culpable carelessness. The best bread-makers I have ever known, watch over their bread troughs while their dough is rising, and over their ovens while it is baking, with about as much care and attention as a mother watches over the cradle of her sick child.—Dough made of wheat meal requires a hotter oven than that made of fine flour; and it needs to remain in the oven longer. Indeed, it is a general fault of bread of every description, made in this country, that it is not sufficiently baked. Multitudes eat their bread hot and smoking from the oven, in a half-cooked state; and very few seem to think there is any impropriety in doing so. But they who would have their bread good, not only a few hours after it comes from the oven, but as long as it can be kept, must see that it is thoroughly baked.

§ 1387. I have said that the process of vinous fermentation converts a portion of the saccharine matter of the meal into carbonic acid gas or air, by which means the dough is raised and made light; and that the same

process converts a portion of the saccharine matter into alcohol. (§ 1375.) The alcohol thus generated is mostly driven off by the heat of the oven when the dough is baking;—and in modern times, ovens have been so constructed in England, as to serve the double purpose of ovens and stills; so that, while the bread is baking, the alcohol is distilled off and condensed, and saved for the various uses of arts and manufacture.

§ 1388. The question has however, been frequently started, whether a portion of the alcohol thus generated, is not contained in the bread when it comes from the oven. The notion commonly entertained is that the alcohol is wholly expelled by the heat of the oven, in the process of baking; and this opinion I supposed to be correct, until careful and repeated investigation convinced me of its error. I have in numerous instances, within the last twelve months, found, in thoroughly baked bread, soon after it was drawn from the oven, so large a quantity of alcohol that it was strongly perceptible to the sense of smell. Moreover, it is well known that if two portions of wheat meal or flour be taken from the same barrel or sack, and one portion be made into unleavened bread, and the other portion be made into the very best fermented or raised bread, and both be eaten as soon as they are baked, the fermented bread will digest with more difficulty, and oppress and disturb the stomach more than the unleavened bread will. (§ 1341.) Indeed, it is well known and very generally understood, that few of the articles which compose the food of man in civic life, are so trying to the human stomach, and so powerful causes of dyspepsy, as fresh-baked raised bread. It is now well known also, that, alcohol wholly resists the action of the solvent fluid of the stomach, and is entirely indigestible; and always retards the digestion of those

substances which contain it. (§ 453.) How far all this may be true of carbonic acid gas, is not yet ascertained; but it is difficult to account for the difference between leavened and unleavened bread, as above stated, without supposing that the alcohol or carbonic acid gas, or both of them, are in some degree concerned in rendering the leavened bread, when newly baked, peculiarly oppressive and injurious to the stomach. Be it as it may however, it is very certain that when the bread has been drawn from the oven, and permitted to stand in a proper place twenty-four hours,—either by evaporation or some other means, it becomes perfectly matured, and so changed in character, that it is, if properly made, one of the most wholesome articles entering into the diet of man; and at that age, there is not the slightest reason to believe that a particle of alcohol remains in the bread.

§ 1389. When therefore, the bread is thoroughly baked, let it be taken from the oven and placed on a perfectly clean and sweet shelf, in a perfectly clean and well ventilated pantry. Do not, as you value the character of your bread, put it into a pantry where you set away dishes of cold meat, cold potatoes, and other vegetables, and keep your butter, cheese and various other table provisions—in a pantry which perhaps is seldom thoroughly cleansed with hot water and soap, and where the pure air of heaven seldom if ever has a free circulation. The quality of your bread should be of too much importance to allow of such reprehensible carelessness, not to say sluttishness. And if you will have your bread such as every one ought to desire to have it, you must pay the strictest attention to the cleanliness and sweetness of the place where you keep it. If in baking, the outer crust should become a little too dry and crispy, you can easily remedy this by throwing a clean bread or table cloth over it for a short time, when it first

comes from the oven; but if this is not necessary, let the bread stand on an airy shelf, till it becomes perfectly cool, and when it is twenty-four hours old, it is fit for use; and if it is in all respects properly made, and properly kept, it will continue to be sweet and delicious bread for two or even three weeks, except perhaps in very hot and sultry weather.

§ 1390. When we have acquired the art of making such bread as I have described, in the very best manner, then have we carried the art of cooking to the very height of perfection; for it is not only true, that there is no other artificially prepared article in human diet of so much importance as bread, but it is also true that there is no other preparation in the whole round of cooking, which requires so much care and attention and experience and skill and wisdom.

Who should make Bread?

§ 1391. Who then shall make our bread? For after all that science in its utmost accuracy can do, in ascertaining principles and in laying down rules, there is little certainty that any one, who undertakes to make bread by merely rule, will be any thing like uniformly successful. We may make a batch of bread according to certain rules, and it may prove excellent; and then we may make another batch according to the same rules, which may be very poor. For, if we follow our rules ever so closely, there may be some slight differences in the quality or condition of the meal or the yeast, or something else, which will materially alter the character of the bread, if we do not exercise a proper care and judgment, and vary our operations according as the particular circumstances of the case may require. Correct rules are certainly very valuable; but they can

only serve as general way-marks, in the art of bread-making. Uniform success can only be secured by the exercise of that mature judgment which is always able to dictate those extemporaneous measures which every exigency and circumstance may require; and such a judgment can only result from a care and attention and experience which are the offspring of that moral sensibility which duly appreciates the importance of the quality of bread, in relation to the happiness and welfare of those that consume it. But are we to look for such a sensibility in public bakers? Can we expect that they will feel so lively and so strong an interest for our enjoyment and for our physical and intellectual and moral well-being, that they will exercise all that care and attention and patience, and watch with that untiring vigilance and solicitude in all the progress of their operations, which are indispensably necessary in order to secure us the best of bread? Or can we reasonably expect to find these qualifications in domestics—in those who serve us for hire? Many a female domestic, it is true, can make much better bread than her mistress can. Many a female domestic has an honest and sincere desire to do her duty faithfully; but can she be actuated by those sensibilities and affections which alone can secure that careful attention, that soundness of judgment, that accuracy of operation, without which the best of bread cannot uniformly, if ever be produced?

§ 1392. No;—it is the wife, the mother only—she who loves her husband and her children as woman ought to love, and who rightly perceives the relations between the dietetic habits and physical and moral condition of her loved ones, and justly appreciates the importance of good bread to their physical and moral welfare,—she alone it is, who will be ever inspired by that cordial and unremitting

affection and solicitude which will excite the vigilance, secure the attention, and prompt the action requisite to success, and essential to the attainment of that maturity of judgment and skilfulness of operation, which are the indispensable attributes of a perfect bread-maker. And could wives and mothers fully comprehend the importance of good bread, in relation to all the bodily and intellectual and moral interests of their husbands and children, and in relation to the domestic and social and civil welfare of mankind, and to their religious prosperity, both for time and eternity, they would estimate the art and duty of bread-making far, very far more highly than they now do. They would then realize that, as no one can feel so deep and delicate an interest for their husbands' and children's happiness as they do, so no one can be so proper a person to prepare for them that portion of their aliment, which requires a degree of care and attention that can only spring from the lively affections and solicitude of a wife and mother.

§ 1393. But it is a common thing to hear women say—"We cannot always have good bread, if we take ever so much pains;—it will sometimes be heavy, and sometimes be sour, and sometimes badly baked, in spite of all our care." It may be true that such things will sometimes happen, even with the best of care;—but I believe that there is almost infinitely more poor bread than there is any good excuse for. The truth is, the quality of bread is a matter of too little consideration; and therefore too little care is given to the making of it. Moreover, the sense of taste is so easily vitiated, that we can very easily become reconciled to the most offensive gustatory qualities, and even learn to love them; and it is a very common thing to find families so accustomed to sour bread, that they have no perception of its acid quality.

"It is very strange," said a lady to me one day at her dinner table, "that some folks always have sour bread, and never know it." She then went on to name a number of families in the circle of her acquaintance, who, she said, invariably had sour bread upon their tables when she visited them—"and they never," continued she, "seem to have the least consciousness that their bread is not perfectly sweet and good." Yet this very lady, at the very moment she was thus addressing me, had sour bread upon her own table; and although I had for many months been very frequently at her table, I had never found any but sour bread upon it. Still she was wholly unconscious of the fact.

§ 1394. Difficult however, as most women think it is, to have good bread always, yet there are some women who invariably have excellent bread. I have known such women. The wife of Thomas Van Winkle, Esq., of the beautiful valley of Booneton, New Jersey—peace to her ashes!—was deservedly celebrated throughout the whole circle of her acquaintance for her excellent bread. Few ever ate at her hospitable board once, that did not desire to enjoy the privilege again. I know not how often it has been my good fortune to sit at her table; but the times have not been few; and though long past, and she who presided there has slept for years in her grave, yet the remembrance of those times and of those hospitalities, awakens in my bosom a deep and fervent sentiment of gratitude while I write.—Never at the table of Mrs. Van Winkle did I eat poor bread;—and of my numerous acquaintances who had sat at her table, I never heard one say he had eaten poor bread there. Her bread was invariably good. Nay, it was of such a quality that it was impossible for any one to eat of it, and

not be conscious that he was partaking of bread of extraordinary excellence.

§ 1395. Mrs. Van Winkle, said I to her one day, while I was feasting on her delicious bread, tell me truly, is there either a miracle or mystery in this matter of bread-making, by which you are enabled to have such excellent bread upon your table at all times, while I rarely ever find it equally good at any other table, and at ninety-nine tables in a hundred, I almost invariably find poor bread? Is it necessarily so? Is it not possible for people by any means to have good bread uniformly? "There is no necessity for having poor bread at any time, if those who make it will give proper care and attention to their business," replied Mrs. Van Winkle, confidently. "If every woman will see that her flour is sweet and good, that her yeast is fresh and lively, that her bread trough is kept perfectly clean and sweet, that her dough is properly mixed and thoroughly kneaded, and kept at a proper temperature, and at the proper time moulded into the loaf, and put into the oven, which has been properly heated, and there properly baked, then good bread would be as common as poor bread now is. But while there is such perfect carelessness and negligence about the matter, it is not surprising that bread should be generally poor."

§ 1396. Mrs. Van Winkle was undoubtedly correct. If any thing like the care were given to bread-making that its real importance demands, a loaf of poor bread would rarely be met with. Indeed, if the same degree of care were given to bread-making, that is devoted to the making of cakes and pastry, we should far more generally be blessed with good bread.—Who does not know, that as soon as girls are old enough to go into company and to give parties, they begin to notice with

great interest the qualities of the different kinds of cake and pastry which they meet with: and whenever they find any thing very nice, they are exceedingly curious to learn precisely how it was made. And lest memory should be treacherous, they will carefully write down the exact rules for mixing and cooking it;—“so many pounds of flour, so many pounds of butter, so many pounds of sugar, so many eggs, and spice to your taste—the eggs to be beaten so and so, the whole mixed so and so, and baked so many minutes,” &c. &c. And thus with great care and industry they collect and write down, in a book which they keep for the purpose, all the recipes they can get hold of, for making every kind of cake and pastry used in society. And when they are preparing for company, they rarely if ever order Dinah or any other domestic to make their nice cake. They do not regard it as a menial office, but as a highly genteel employment; and their great desire to have their cake and pastry as good as it can be made, prompts them to undertake the manufacture of it themselves. And during this operation, the scales, the measures, the clock or watch, all are brought into requisition; the Recipe Book is placed upon the table before them, and carefully consulted; and every thing is done with the utmost precision and exactitude and vigilance. And if the young lady feels any misgiving as to her own judgment or taste or experience, she earnestly inquires of Ma, or some one else who she thinks is capable of giving her advice in so important a matter.—If in the midst of this employment some one knocks or rings at the door, and a young gentleman is announced, she is not at all embarrassed, but perhaps hastens to the parlor with her delicate hands covered with dough, and with an air of complacency and self-satisfaction, says—“ Good morning, Frank—how

do you do? I am just engaged in making some cake—I hope you will excuse me for a few moments."

§ 1397. All this shows that she regards the quality of her cake as of very great importance, and considers it not only perfectly respectable, but highly *genteel* for a young lady to be employed in making cake. But in regard to bread and bread-making, every thing is very different; there is none of this early curiosity to learn how to make good bread. Young ladies do not on every occasion when they find excellent bread, carefully and minutely inquire how it was made, baked, &c., and write down the recipe;—but when a batch of bread is to be made for the family, they either leave it for Mother or some domestic to make, or go about it themselves as some irksome and disreputable piece of drudgery; and consequently, they turn the task off their hands with as much despatch and as little trouble as possible. If all things happen to be as they should be, it is well; if not, they must answer for the present. If the yeast happens to be lively and sweet, very lucky. If otherwise, still it must be used. If the dough rises well and is got into the oven before it becomes sour, very fortunate; if not, why, "nobody can avoid mistakes—and bread will sometimes be poor in spite of the greatest care;"—and if a batch of miserable bread is the result of such an operation, then all that remains to be done is to eat it up as soon as possible, and hope for better the next time. If Frank, or Charles, or Edward should call while the young lady is engaged in making bread, she is perhaps quite disconcerted, and would not for the world have him know what she is doing;—she sends word to him, either that she is out, or that she is particularly engaged, and begs he will excuse her;—or if by any means she happens unexpectedly to be caught at her employment, she

is greatly embarrassed, and makes the best apology she can for being engaged in such menial services.

§ 1393. As a matter of course, while such are the views and feelings entertained on this subject, and while such is the manner in which this duty is performed, it will ever be a mere accident, if good bread is made; and a mere accident if such girls ever become good bread-makers when they are wives and mothers. But if parents and especially mothers, could view this matter in its true light, how differently would they educate their children. They would then feel that, grateful as it is to a mother's heart to see her daughters highly refined and elegantly accomplished, and able to "make the instrument discourse most eloquent music," and to transfer living nature, with all its truth and beauty and sublimity, to the canvass, still the art of bread-making, when considered in all its relations and intimate connexions with human health and prosperity and virtue and happiness, and with reference to the natural responsibilities and duties of woman, is actually one of the highest and noblest accomplishments that can adorn the female character. And then, too, would they consider it of exceedingly great importance, that their daughters should possess this accomplishment, even though they may never be in circumstances which will require the exercise of it.

§ 1399. Some eight or ten years since, I spent several months in the delightful village of Belvidere, on the banks of the Delaware, in Pennsylvania. While there, I enjoyed for a number of weeks the kind hospitality of J—— S——, Esq., a lawyer, and a gentleman of great moral excellence. Mrs. S. was born and brought up, I believe, in Philadelphia. Her father was a man of wealth, and she was the only daughter, and—almost as a matter of course—was indulged in all that she desired.

But there were so many of the elements of a good wife and mother in her natural composition, that as soon as she entered into those interesting and important relations, she began to devote herself to the duties of them with a sincerity and conscientiousness which could not fail of success. Surrounded as she was, with wealth, and every comfort and convenience of life, and all of its luxuries that she desired, still she was industrious in her habits, and vigilantly attentive to all the concerns of her household. She usually kept three female domestics, who, by her kind, maternal deportment towards them, were warmly attached to her. She had no difficulty in procuring nor in keeping help, because she always treated them in such a manner that they loved to stay with her; and she took much pains to qualify them for the proper discharge of their duties. They evidently loved her, and were sincerely desirous of performing all their services in such a manner as would be pleasing to her. Yet with all these advantages to justify her leaving such a duty to her domestics, Mrs. S. invariably made the family bread with her own hands. Regularly as the baking day came, she went into her kitchen and took her stand beside the bread trough, and mixed and kneaded the dough, and put it in its proper place for rising, and, in due time, moulded it into the loaf and baked it.—Do you always make your bread, madam? I inquired one day, as she returned from the performance of that task. “Invariably,” she replied: “that is a duty I trust no other person to do for me.”—But cannot your domestics make good bread? I asked. “I have excellent domestics,” answered Mrs. S., “and they can, perhaps, make as good bread as I can; for they have been with me several years, and I have taken pains to learn them how to do my work; and they are exceedingly faithful

and affectionate, and are always willing to do all they can to please me; but they cannot feel for my husband and my children as I do, and therefore, they cannot feel that interest which I do, in always having such bread as my husband and my children will love and enjoy. Besides, if it were certain their care and vigilance and success in bread-making would be always equal to mine, yet it is wholly uncertain how long they will remain with me. Various circumstances may take place, which may cause them to leave me, and bring me into dependence upon those who know not how to make good bread; and therefore, I choose to keep my own hand in. But, apart from all other considerations, there is a pleasure resulting from the performance of this duty, which richly rewards me for all the labor of it. When my bread is made and brought upon the table, and I see my husband and children eat it and enjoy it, and hear them speak of its excellence, it affords me much satisfaction, and I am glad to know that I have contributed so much to their health and happiness; for, while my bread is so good that they prefer it to any thing else upon the table, there is little danger of their indulging, to any injurious extent, in those articles of food which are less favorable to their health."

§ 1400. I need not say that this lady invariably had excellent bread upon her table. But instances of this kind are, I regret to say, extremely rare, even in Christian communities; and therefore, when such cases are known, they ought to be held up as most noble examples of female virtue, and receive such high commendations as their intrinsic merit deserves, and such as will be calculated to beget in the minds of others an exalted sense of the dignity and importance of such duties, and prompt every wife and mother to the intelligent and affectionate performance of them.—For it should ever be remem-

bered that, though our children, while they depend on us for protection, are also, properly the subjects of our government, yet as soon as they are capable of appreciating our authority and our influence, they are, like ourselves, moral agents, and ought, in all respects, to be governed and nurtured as such; and therefore, it is not enough that we can give them such food as we think best for them, and *compel* them to eat it; but the grand point at which the mother should always aim, in this matter, is to place before her children such food as is the very best for them, and at the same time, to make it the most agreeable to them, and thereby make their duty and their enjoyment perfectly coincide.

§ 1401. Let no one therefore, say she cannot always have good bread, until she can truly affirm that she has fairly made the experiment; that she has, in view of all its relations and bearings, accurately estimated the importance of the quality of her bread in regard to the welfare of her household, and, with a proper sense of her responsibilities as a wife and mother, has *at all times* felt that interest and exercised that care and attention which so important a duty demands, and without which it must ever be a mere accident whether her bread is good or bad. They that will have good bread, not only for a single time, but uniformly, must make the quality of their bread of sufficient importance, in their estimation and feelings, to secure the requisite attention to the means by which alone such an end can be made certain. They must not suffer themselves, through carelessness, to get entirely out of bread unexpectedly, and thus be obliged, without due preparation, to make up a batch of such materials as they may happen to have at hand, and bake it in haste, and hurry it to the table. But they must exercise providence and foresight: they must know, before-

hand, when their supply of bread will probably be out, and when they will need to make another batch; and they must see beforehand, that measures are taken to secure a proper supply of all the requisite materials;—see that they are furnished with good meal or flour, and they must be sure to have the best of yeast or leaven, when they need it,—and when the time comes for them to make their bread, if by any means, the yeast should not be good, let them throw it away and make good, before they proceed to make their bread; for it is infinitely better that the family should even do without bread one day, and eat roasted potatoes, than that they should eat poor bread three or four days; and if, from any cause, the bread should be poor, it is incomparably better to throw it away, than to set it upon the table, to disgust the whole family with bread, and drive them to make most of their meal on something else. If a lady can ever find a good excuse for having poor bread, she certainly can find none, except perhaps extreme poverty, for setting her poor bread on the table the second time. Yet, too generally, women seem to think that, as a matter of course, if they, by carelessness or any other means, have been so unlucky as to make a batch of poor bread, their family and friends must share their misfortune, and help them eat it up; and, by this means, many a child has had its health seriously impaired, and its constitution injured, and perhaps its moral character ruined—by being driven in early life, into pernicious dietetic habits.

§ 1402. It was observed many years ago, by one the most eminent and extensive practitioners in New England, that, during a practice of medicine for thirty years, he had always remarked that, in those families where the children were most afflicted with worms, he invariably found poor bread; and that, as a general fact,

the converse of this was true; that is, in those families where they uniformly had heavy, sour, ill-baked bread, he generally found that the children were afflicted with worms.

§ 1403. A careful and extensive observation for a few years, would convince every intelligent mind that there is a far more intimate relation between the quality of the bread and the moral character of a family, than is generally supposed.—“Keep that man at least ten paces from you, who eats no bread with his dinner,” said Lavater, in his “Aphorisms on Man.” This notion appears to be purely whimsical at first glance: but Lavater was a shrewd observer, and seldom erred in the moral inferences which he drew from the voluntary habits of mankind; and depend upon it, a serious contemplation of this apparent whim, discloses a deeper philosophy than is at first perceived upon the surface.—Whatever may be the cause which turns our children and ourselves away from the dish of bread, and establishes an habitual disregard for it, the effect, though not perhaps in every individual instance, yet, as a general fact, is certainly, in some degree, unfavorable to the physical and intellectual and moral and religious and social and civil and political interests of man.—Of all the artificially prepared articles of food which come upon our table therefore, bread should be that one which, as a general fact, is uniformly preferred by our children and our household,—that one, the absence of which they would notice soonest, and feel the most,—that one which,—however they may enjoy for a time the little varieties set before them—they would be most unwilling to dispense with,—and which, if they were driven to the necessity, they would prefer to any other dish, as a single article of subsistence.—To effect this state of things, it is obvious that, the quality of the

bread must be uniformly excellent; and to secure this, I say again, there must be a judgment, an experience, a skill, a care, a vigilance, which can only spring from the sincere affections of a devoted wife and mother, who accurately perceives and duly appreciates the importance of these things, and, in the lively exercise of a pure and delicate moral sense, feels deeply her responsibilities, and is prompted to the performance of her duties. Would to God that this were all true of every wife and mother in our country—in the world!—that the true relations and interests and responsibilities of life were understood and felt by every human being, and all the duties of life properly and faithfully performed!

Varieties of Bread.

§ 1404. I have thus far spoken almost entirely of wheaten bread, because I consider that the most wholesome kind of loaf bread for ordinary use—for “daily bread.” When bread is made of superfine flour, the same general rules should be observed.—Rice, barley, oats, rye, Indian corn, and many other farinaceous products of the vegetable kingdom may also be manufactured into bread, but none of them will make so good loaf bread as wheat. Good rye raised on a sandy soil, when cleansed and ground in the manner I have already described, and prepared in all respects according to the rules I have laid down, will make very excellent bread. Rye, coarsely ground, without bolting, and mixed with Indian meal, makes very wholesome bread, when it is well made. Good rye and Indian bread is far more wholesome for common or every-day use, than that made of superfine flour.

§ 1405. There are various ways of preparing Indian

meal bread: and wheu such bread is well made, it is very wholesome—much more so for every-day use, than superfine flour bread. Indeed, Indian corn, in the various simple modes in which it is prepared for hunian aliment, is one of the most wholesome productions of the vegetable kingdom. “In a memoir lately read before the French Academy,” says the Journal of Health, “the author undertook to show that maize (Indian corn) is more conducive to health than any other grain; and, as a proof of this, the fact was adduced that, in one of the departments in which this grain was most abundantly and universally used, the inhabitants were remarkable for their health and vigor.”—One great drawback to the wholesomeness of Indian meal bread, however, is that, it is almost universally eaten hot, and too generally, pretty well oiled with butter, or some other kind of animal fat or oil. Nevertheless, it can be prepared in such a manner as to obviate these difficulties, and render it very wholesome.

§ 1406: Barley and oats may be manufactured into very wholesome bread; but they are little used for such purposes in this country.—Rice, arrowroot, tapioca, sago, peas, beans, chestnuts, millet, buckwheat, potatoes, &c., may also, by mixing them with a portion of wheat or rye flour, be manufactured into loaf bread; but as I have already stated, there is no other kind of grain or farinaceous vegetable substance from which so good loaf bread can be made, as good wheat.

§ 1407. In making bread from Indian meal, and other kinds of farinaceous substances containing little or no gluten, yeast or leaven is rarely if ever used to make it light. More generally sour milk or butter-milk and saleratus or soda are used for this purpose; and they who do not well understand the principle upon which these substances make their bread light, often greatly impair

their own success by their mismanagement.—It is, perhaps, most common for them to mix their sour milk or butter-milk and saleratus together, and wait till the effervescence is over, before they stir in their meal. But by this means they lose the greater part of the gas or air by which their dough should be made light. The true way is to take their sour milk or butter-milk, and stir meal into it till a thin batter is formed, and then dissolve their saleratus or soda, and stir that quickly and thoroughly into the batter, and then hastily add meal till the batter or dough is brought into the consistency desired. If, instead of sour milk or butter-milk, a solution of muriatic or tartaric acid is used, the bread will be equally light. In this case, the batter should be first made with a solution of saleratus or soda, and then the solution of acid should be stirred in as above described. Batter cakes are made in this manner very light and very promptly. When from any cause batter or dough mixed with yeast fails to rise according to expectations, the thorough mixing in, first, the solution of muriatic or tartaric acid, and then the solution of saleratus or soda, will, in a few minutes, make the whole mass very light, but such cakes and bread are not so sweet and savory as those raised with good sweet yeast.

§ 1403. I have said, (§ 1348.) that recently ground meal makes far sweeter and richer bread, than that which has been ground a considerable time; but as it is not convenient for many families to send to a mill as often as they would like to have fresh meal, they are obliged generally to use staler meal or flour than they would choose. Yet every family might easily be furnished with a modern patent hand-mill, constructed after the plan of a coffee-mill, with which they could at all times, with great ease, grind their wheat and rice and corn, as they want it, for bread and

other purposes. With these mills they can grind their stuff as finely or coarsely as they wish, for bread or hominy, and always have it very fresh and sweet.

§ 1409. Perfect bread-making, I have said, (§ 1390.) is the top of perfection in the art of cooking. When good bread is made therefore, culinary skill has done its utmost. Wheat meal and flour, and the flour of other kinds of grain and vegetables, may be prepared in a great variety of other ways: but the stern truth is, that as a general rule, every departure from the simple form of bread, in cooking these substances, is more or less detrimental to the physiological interests of man:—and all those mixtures and compounds of flour and butter or lard, and sugar, or molasses, or honey, and eggs, and spices, &c. &c. comprehended by the terms “pastry,” “cakes,” “confectionary,” &c. are among the most pernicious articles of human aliment in civilized life;—doing incomparably more mischief than simply prepared flesh-meat. (§ 1085.) Yet there are some deviations from the simplicity of bread, which are far less objectionable than others. Let it be continually kept in mind, as a general rule, however, that, all concentrations of vegetable as well as animal substances, (§ 1322.) and all artificial combinations of those concentrated substances, in preparing the food of man, (§ 1323.) are always, more or less, at variance with the physiological laws of constitution and relation, established in our nature. (§ 693.—767. Hence, though the saccharine matter of vegetables is highly nutritive and salutary, when received in the state in which nature produces it, yet, when concentrated in the form of syrup, like molasses or honey, and still more, in the crystallized form of sugar, it is decidedly unfriendly to the physiological interests of our bodies; and especially when used

alone, or too freely with other substances. All this is likewise true of the vegetable acids. (§ 710.) Nevertheless, molasses and honey and sugar and vegetable acid may occasionally be used, to a limited extent, with other substances, without greatly infringing the physiological laws and interests of our bodies; provided always, that, as a general rule, a proper regard be paid to the due proportions of nutritious and innutritious matter (§ 1322.) or of bulk and nutriment:—and that butter, or lard, or any kind of fat or oil does not enter into the composition. For it must ever be remembered as a most important consideration, that the mixing of lard or butter, or any kind of animal fat or oil, with flour or meal, or any other vegetable substance in the making of puddings, cakes or pies, or preparing any other kind of food, is a great violation of the physiological laws of the digestive organs, (§ 1278. 1279. 1323.) and that the articles thus prepared, are more difficult to digest, and more irritating to the stomach, than almost any other kind of food eaten by civilized man. (§ 1297.)

§ 1410. The sweet cream of good milk, (§ 1306.) though essentially an oleaginous substance, yet, in its recent state, or when taken from milk not more than twelve hours from the cow, being perfectly soluble in the fluids of the mouth and stomach, (§ 1307.) is far less objectionable than even the best of butter, and incomparably more wholesome than any other animal fat; and therefore, if any kind of shortening *must* be used—that is, if human beings are determined they *will* use it, in the preparation of pastry and other kinds of food, good sweet cream is, in every respect, vastly preferable to any other kind.—Puddings, cakes, pies and all other kinds of pastry may be made more truly rich and delicately nice, with sweet cream and new milk, than by the use of

butter or any other animal fat or oil; and no one can become accustomed to pastry thus prepared, without greatly preferring it to that in which lard or butter largely abounds.

§ 1411. A small quantity of new milk, or cream, or both together, may also be used in making toast, with comparatively little objection.—When bread has become stale, if it be carefully toasted and then some new milk, heated and seasoned with a little salt, be poured upon it, it makes a most delicious and wholesome toast, which will sit perfectly well upon the most delicate and feeble stomach.—If a little sweet cream is used with the milk, it makes the toast richer, but not more wholesome.—In short; if in every case, and for all purposes pertaining to the diet of man, people would substitute good sweat cream for butter and other animal fats or oils, they would be great gainers in health and comfort, and even in the amount of their gustatory enjoyment; and if they would go still further, and abandon the use of cream also, they would, as a generation, and as a species, be still greater gainers.

§ 1412. Rice, wheat, Indian corn, and all the other farinaceous grains and substances, may be converted into puddings, in a comparatively simple and wholesome manner. Custards, made of good fresh eggs (§ 1308.) and milk and sugar, very slightly cooked, are also comparatively innocent for occasional use.—The custard, squash, apple, blackberry and other pies may be made comparatively simple and wholesome by a proper regard to the principles which I have already laid down. The pastry can be made very nice and very delicious without a particle of lard or butter. A little sour butter-milk, or sour milk, with at most, a little good cream, skilfully managed, will make a much more delicious, as well as more wholesome pie-crust than can be made with lard or butter: and

some make it very good without using even these, by employing boiled and finely mashed potatoes for shortening.

§ 1413. After all, however, it must be remembered that all these things are greater or less departures from the strict line of physiological truth, (§ 1320.—1328.) rendering our food somewhat less wholesome in itself, and increasing our temptation to indulge to excess. (§ 1326.)—If we have vigorous constitutions, and are in good health, and of active and athletic habits, they may never so affect us as to enable us distinctly to perceive their evil consequences in ourselves; yet, it is not more certain that the continual revolutions of a wheel, gradually—though by imperceptible degrees, wear the axle on which the wheel revolves, than it is that every deviation from the laws of constitution and relation established in our nature, impairs, in some degree, our physiological powers, and abbreviates the period of our existence; (§ 735.) and though the effects may not always be evident and unequivocal in the individual, yet they are conspicuous in the race, when regarded in a succession of generations. (§ 887.)

§ 1414. What then?—it is asked, shall man live by bread alone?—I answer, No!—the vegetable kingdom affords us a boundless variety of substances for our food, (§ 1315.) and the capabilities of the soil, for the improvement and augmentation of that variety, are almost unlimited. Some of these substances may be prepared with the greatest simplicity, and a very large proportion of them, may be eaten without any artificial preparation.

§ 1415. Besides the several kinds of grain which I have mentioned,—beans, peas, potatoes, beets, carrots, parsnips, turnips, pumpkins, squashes, cabbage, &c. are among the vegetables common to our climate, and which, at most, require no other preparation than simple boil-

ing, roasting or baking.—Cabbage, radishes, cucumbers, lettuce and other salads, which are often complained of in civic life, as being too crude and indigestible for the human stomach,—are managed with perfect ease and comfort and safety, by those who are healthy and vigorous; and who subsist wholly on vegetable food, properly prepared; and abstain from stimulating and heating substances. Hence, they who subsist in the ordinary manner of civic life, are unfit to give rules, from their own experience, for the dietetic habits of others, in different circumstances. In fact, no rules which are not founded on, or are not compatible with the general and permanent physiological principles of human nature, are good for any thing,—except, possibly in some instances, as mere temporary expediencies for particular emergencies.

§ 1416. But, besides bread in some form or other, (§ 1338.) fruit is the most natural and appropriate food of man: (§ 780.) and here the earth is truly bountiful in her variety and abundance. Apples, pears, peaches, plums, cherries, grapes, strawberries, raspberries, blackberries, whortleberries, gooseberries, watermelons, muskmelons, &c. &c. are produced in great abundance, and are capable of being improved to the highest perfection, and in almost infinite varieties; and these may be eaten with, or without bread, when perfectly ripe, without any artificial preparation or cooking.—And our benevolent Creator has so ordered the seasons, and the regular succession in which they are produced, that even in our climate, we can be supplied with some kind or other, of delicious and wholesome fruit, fresh from the bosom of nature, almost the whole year round; and the apple can, by proper care, be kept in its natural state through the winter and spring, till a new year brings us fresh supplies. And then there is a great variety of nuts which

are admirably fitted for the winter's use, and which are very delicious and perfectly wholesome to the vegetable-eater whose general regimen is correct. Moreover, the apple, pear, peach, cherry, plum, strawberry, raspberry and a great number of other fruits may be preserved by drying; so as to furnish us with a rich variety of delicacies, during the whole winter. The good ripe peach and other kinds of fruit, when well dried in the autumn, may be stewed in some water with a little sugar, and make a delicious dish of sauce to eat with our bread in the winter and early spring. Besides this, the fruits may be preserved in their own inspissated juices, so as to make exceedingly delightful substitutes for fruit in its natural and recent state. Thus, if a quantity of choice rich sweet apples, be gathered and made clean, and ground in a clean mill, and the juice immediately pressed out, and filtered through washed sea-sand and pulverized charcoal, and then put into a proper vessel over a slow fire, and the water evaporated till the juice becomes a thick syrup, and if, in the mean time, some mildly acid apples be divested of the skin and core and put into this syrup, till they are cooked through,—a delightful sauce will be produced, which will serve instead of the ordinary use of butter, with our bread, through the whole winter.—Peaches, strawberries, and other fruit may also be preserved in this same, simple manner.

§ 1417. But here again I must repeat, that every species of artificial preparation opens the way to evil, principally from four grand sources. First, the want of the proper exercise of the teeth, (§ 719.) and consequent insalivation and complete trituration of the food before it is swallowed. (§ 727.) Second, eating too fast and too much: (§ 426.) third,—improper concentrations (§ 1322.) and combinations: (§ 1323.) and fourth, improper temperature. (§ 1321.) All four of these sources

of evil must therefore, be constantly guarded against:—and the utmost pains should habitually be taken to cultivate fruit of every variety, to the highest perfection and in the greatest abundance, in order that our tables should be at all times, furnished as far as possible with that which will be delicious and wholesome in its natural state.

§ 1418. But it should always be remembered that, fruit of every description, if eaten at all, should be eaten as food, and not as mere pastime, or merely for the sake of gustatory enjoyment: and therefore, it should, as a general rule, be eaten at the table, or constitute a portion of the regular meal.—I do not mean as the dessert of flesh-eaters after they have eaten already enough of other food;—but I mean as a portion of the regular meal of vegetable-eaters,—taken with their bread, instead of flesh and butter; for their breakfast and their dinner; but more sparingly at their third meal or supper—especially if the third meal be taken late in the day.—The truth is that, all cooked food, even under the best regulations, impairs in some degree, the power of the stomach to digest uncooked substances; and therefore, so long as we are accustomed to cooked food of any kind, we must be somewhat more careful in regard to the times when we eat fruit and other substances, in their natural state. The digestive organs always, in health, partake of the general vigor and freshness of the body, and always share with it also in its weariness and exhaustion. Hence, as a general rule, so long as we are accustomed to cooked food, the stomach will always digest fruit and other substances in their natural state, better in the early, than in the latter part of the day. Moreover, it is a truth of considerable importance, that fruit and other substances in the natural state, are digested with more ease and comfort, when

taken alone, at a regular meal time, than when taken with any kind of cooked food, except good bread. While therefore, human beings, and especially in civilized life, wholly disregard these physiological principles, and eat fruit with any thing and every thing else, and at all hours of the day and night, they ought not to be surprised, and still less should they complain, if they suffer from their erroneous habits. But nothing is more certain than that, if human beings will, in a reasonable degree, conform to the physiological laws of their nature, they may eat almost every variety of esculent fruits which the vegetable kingdom produces, with entire safety and comfort.

§ 1419. Be it understood that, I do not pretend to name all the products of the vegetable kingdom proper for human aliment.—It is my object to teach general principles in regard to life, health and regimen, rather than to give particular dietetic prescriptions or formula. There are doubtless, many excellent fruits and vegetables of our own climate, which I have not spoken of: and many, of other climates, which are wholesome and delicious. As a general rule, however, the fruits of other climates which are gathered before they are perfectly ripe, are to be avoided as unwholesome and unsafe.—With the great physiological principles before him which I have presented and shall present in these lectures, every intelligent individual can guide himself in the details of practical application, and therefore, it is enough for me to say in general terms, that, if the dietetic and other habits of man, were true to the laws of his nature, he might safely partake of most or all of the esculent products of the vegetable kingdom; and he might easily cultivate the richest, and most bountiful variety of fruits and vegetables, of every description, for his enjoyment; and extend his gustatory pleasures far beyond any thing that is, or can

be experienced, by the flesh-eating epicure. (§ 712.) But this will not,—it *cannot* be done, while flesh continues to be so important an article in the diet of human beings, in our country. (§ 868.)

§ 1420. In conclusion of the whole matter, in relation to kinds and qualities of food then, I will summarily recapitulate that, those who *will* eat flesh, should use but a small quantity of the healthy, lean fibre, (§ 1281.) once a day;—prepared in the manner I have named (§ 1289.) and accompanied with good bread, and one or two kinds of vegetables at most, simply prepared, and eaten plain:—but while they continue to eat flesh, let them be careful how they indulge in fruits and vegetables in their natural state. (§ 1309.)—While on the other hand, they who subsist wholly on a pure diet of vegetable food and water, under a *correct* general regimen,—and particularly those who are accustomed to such a diet from childhood, may partake with safety and enjoyment, of every esculent fruit and vegetable that the wide earth produces or can be made to produce;—provided, always, that every such article is of a healthy growth, and properly matured before it is plucked or gathered, and eaten as a portion of the regular meal, at proper times, and in proper quantities. The vegetable-eater, also, by the help of fire, can prepare many green vegetables, such as peas, beans, corn and other products of the garden, which, although they are far from being most perfectly adapted to his physiological wants and interests, yet, when prepared in the best manner,—(§ 1415.) and eaten plain, with good bread, and in temperate quantities, are comparatively harmless, and give a pleasant variety to our diet.

§ 1421. Finally, let it ever be remembered as a matter of the utmost importance, that, whatever constitutes the food of man, it should always be of the very best quality.

Serious attention should be given that the wheat and all other kinds of grain, and every kind of fruit and vegetables that he employs for food, are of the most perfect character, and that they are prepared—so far as artificial preparation of any kind is necessary—in the most perfect manner. The bread should be the best that can be made—the potatoes and other vegetables should be cooked in the best possible manner; (§ 1415.) but in great simplicity:—every thing, in short, should be done with care, aiming at perfection. It is surprising what a difference can be made in these things.—Some women will prepare a plain vegetable dinner in such a manner that almost any man in the civilized world, would feel it a privilege to partake of it; while others will get it up in such a way as to render its very appearance disgusting. Order, neatness, good taste and a sound judgment, should be diligently cultivated by all who attempt a practical exemplification of the principles inculcated in these lectures.

LECTURE XXII.

Physiological principles in regard to times of eating—Different theories of hunger—Beaumont's theory—The true physiology of hunger—Natural regularity and periodicity of vital action—Hunger naturally recurs at regular periods, and becomes an established physiological habitude—Flesh-meat increases the urgency of hunger—the pure stimulants still more—The more stimulating the diet, the more frequent and importunate will hunger be, and the more will it demand stimulation rather than alimentation—The vegetable-eater fasts longer than the flesh-eater without distress—Five general inductions in regard to hunger as an indication of the alimentary wants of the system—The practical application of these principles—The number of meals in a day, and the proper duration of time between meals—if three meals are taken in a day, the last should be light and not too near the sleeping hour—The importance of great regularity in the times of eating—Never eat between meals—Late suppers very mischievous—Dietetic regularity of children and aged people.

§ 1422. In regard to the proper times of eating, physiology does not teach us precisely, at what hours, nor how frequently we shall take our meals: but it does determinately establish for us, certain general principles, or great way-marks, by which we are led to conclusions sufficiently exact and determinate for our purpose.

§ 1423. I have frequently spoken of hunger as a special sense, (§ 247. 599. 605.) and in part, already explained its physiology; (§ 767. 1202.)—but a correct understanding of the physiological character and laws of this sense, is of so much practical importance that I shall now enter into a more full explanation and illustration of

them.—It would hardly be a profitable employment of time, to recite the various opinions which have been entertained on this subject, during the last twenty-five hundred years.—It is enough to say that the theory of hunger has always corresponded with that of digestion. (§ 431.) After Spallanzani had established the doctrine of a solvent gastric fluid, he advanced the idea that hunger was caused by the action of that fluid, on the inner coat of the empty stomach; and this notion was very generally received, and has continued in vogue to the present time. The recent experiments and observations of Dr. Beaumont, of which I have spoken, (§ 431.) have however, fully proved that notion to be incorrect: for he has ascertained by the most careful experiments and observations, continued for nearly eight years, that no gastric juice is ever found in an empty stomach, or one which contains no food or chyme; but that always, when the food is chymified and passes from the stomach, that organ is left entirely empty and clean; and contracts upon itself and remains in this state till some alimentary or other substance is introduced into it, to excite its secretion and muscular contraction. Dr. Beaumont has therefore, attempted another explanation of hunger.—“ My impression,” says he, “ is that hunger is produced by a *distension* of the gastric vessels, or that apparatus, whether vascular or glandular, which secretes the gastric juice:—a distention by the gastric juice of a particular set of vessels or glands, which constitute in part, the erectile tissue of the villous coat of the stomach. The sensation varies according to the different degrees or states of distention, from the simplest desire to the most painful sense of hunger; and is allayed or increased, in proportion to the application or refusal of alimentary stimulus to the excretory vessels:—the greater the distention of

the vessels, the more acute will be the pain; hence the difference between a short and a protracted fast. It almost amounts to demonstration," continues the doctor, "that a large quantity of gastric juice must be contained in appropriate vessels, during a fast, ready to obey the call of aliment: and the quiescence and relief from the unpleasant sensation, which are experienced as soon as the vessels are emptied, are, I think, additional proofs of my opinion."

§ 1424. But this theory of Dr. Beaumont's is quite as untenable as that of Spallanzani's. If hunger be a sensation produced by the distention of the vessels containing the gastric juice, how is it that, that sensation which occurs from physiological habitude at regular periods, according to the individual's customary hour of eating, will subside and totally disappear, if that time is permitted to pass by without any food's being received?—unless, indeed, the wants of the system for nourishment, are real and pressing:—and even then, the same thing will take place to some extent.—Will it be said that there is a re-absorption of the gastric juice and a consequent abatement of hunger?—This is wholly an assumption; of the truth of which, there is no proof;—while many things go to prove the contrary.—But again, if simple distention of the gastric vessels cause the sensation of hunger, how is morbid appetite to be accounted for?—We know that, in certain states of the stomach, resulting from improper dietetic habits, hunger is much more craving and distressing than in a healthier condition of the stomach: and in such a state of things also, hunger is no true indication of the alimentary wants of the system; (§ 767) for it often supervenes with painful energy when fasting would actually be much better for the system than feeding. We know too, that, the same individual feels hunger much

more powerfully when he is in the habit of eating flesh freely, and still more if he uses stimulating condiments, than when he subsists entirely on vegetable food, and abstains from all such condiments. Can these facts be satisfactorily accounted for on the principle of simple mechanical distention? Certainly not.—But there are other facts in point, not more easily got over.—Here are several individuals assembled around a table loaded with sumptuous fare,—their hunger is powerful,—they contemplate the repast with eager desire,—their appetite is exceedingly keen,—the savory viands are smoking on their plates,—and now they are just about to commence their meal. At this moment, several letters are thrown upon the table;—one reads that a steamboat has burst her boilers, and that his beloved wife or child, whom he was hourly expecting home, is scalded to death:—his hunger is entirely gone in an instant.—Another reads an insulting communication, which throws him into a violent fit of anger and his appetite is all gone. Another reads that a dreadful pestilence has broken out and is committing awful ravages in the neighborhood:—a paroxysm of fear at once destroys his hunger.—Another reads that his ship which he believed to have been captured by pirates, has just entered the harbor with a rich freight:—a transport of joy annihilates his hunger.—Another takes a pinch of snuff and his hunger is gone.—Another puts a piece of tobacco in his mouth and his hunger is destroyed.—Another rubs his gums smartly with a little salt and his hunger is subdued.—Another dissolves some tartar emetic,—stirs it up, and contemplates swallowing it, and his hunger disappears.—Now these are not merely fanciful suppositions:—they are real cases which have happened thousands of times. But how are such cases explained by Dr. Beaumont's theory of distention?—Is the

gastric juice re-absorbed in an instant:—or does it instantaneously gush from its distended vessels into the stomach?—Neither!—It is not possible either for re-absorption or disemboguement to take place so instantaneously!—What then becomes of the sense of distention, in the vessels containing the gastric juice, which constitutes the feeling of hunger according to Dr. Beaumont's theory?—It is evident that the theory is wholly at fault. Indeed, the assumed facts on which this theory is founded, are all merely things of the imagination. There is no such thing in reality as “the large quantity of gastric juice,” which Dr. B. is so confident of, “contained in appropriate vessels, during a fast, ready to obey the call of aliment.” Not a particle of gastric juice is formed until the stomach is excited to physiological action by the ingestion of food, and then it is poured into the gastric cavity as fast as it is secreted.—The function of gastric digestion is purely physiological, and every step and peculiarity of the process is the result of vital power and action. (§504.)

§ 1425. We have seen that, the stomach is a primary organ of external relation, (§ 698.) constructed to receive the external substances designed for the nourishment of the body:—that it does not perform its function for itself alone, (§ 697.) but receives and digests food for the whole assemblage of organs, constituting the single system; and therefore it holds an important relation to the whole organic domain, (§ 298.) and is accordingly, connected in its anatomical structure and physiological endowments, most intimately and powerfully, with the common centre of organic life: (§ 231.) and, depending on the voluntary powers for the supplies of that aliment which it receives and digests for the nourishment of the whole system, it is also powerfully connected in anatomical structure and sympathetic relation with the centre of animal perception

and action. (§ 245.) Hence, therefore, when the physiological economy of the system requires a supply of food, it indicates its want in the organ designed to receive that food, and this indication is perceived by the centre which presides over the voluntary functions. (§ 280.)

§ 1426. In the perfect health and integrity of the system, when a supply of nourishment is required, the vital economy brings the stomach into a particular physiological condition, preparatory to the reception and digestion of that nourishment. This condition consists in a concentration of vital energy in the tissues of the organ: (§ 313.) the nerves of organic life distributed to the stomach, (§ 231.) receive an increase of vital stimulus: the vessels become somewhat more injected with blood, (§ 393.) exalting the vital properties of all the other tissues, and preparatory to the secretion of the gastric juice: the temperature of the stomach is slightly elevated, (§ 434.) and the whole organ becomes more red, and has something of an excited appearance. The whole may therefore, be called a state of vital exaltation; and in this state, the stomach is specially prepared for the performance of its functions:—in this state it possesses its greatest functional power; and can digest any alimentary substance with the greatest ease, and most perfectly.

§ 1427. But all this might take place without the consciousness of the animal, (§ 228.) and therefore, without serving in any measure to excite the voluntary powers to furnish the requisite supply of food, were it not for the particular connexion established between the stomach and the centre of animal perception, (§ 280.) by means of the pneumogastric nerve. (§ 245.) This nerve being one of the internal *feelers* of the animal centre, (§ 600.) is so associated with the nerves of organic life in the stomach, that it sympathizes with them, or feels their condi-

tion, and communicates this feeling to the centre of animal perception, and this perception of the physiological state of the stomach, by the animal centre, is the special sense of hunger, (§ 599.) which is a demand of the organic domain on the voluntary powers for a proper supply of food, and naturally excites those powers to satisfy its wants. (§ 605.) In the perfect health and integrity of the system therefore, the special sense of hunger informs us with utmost accuracy, both when food is wanted, and when the stomach is in the best state to receive and digest it.

§ 1428. Every thing in creation is subject to law, (§ 144.) and every thing in nature that has motion or action, naturally observes the strictest regularity. From the revolutions of planetary systems, down to the physiological actions of the simplest vegetable, every thing, when undisturbed, and left to obey its own constitutional laws, is strictly regular, and exactly periodical in the recurrence of its phenomena: and in living bodies, every disturbance of this regularity and periodicity, is in some measure, a violation of their laws and an injury to their constitution.—This is emphatically true of the human system. If the physiological actions of our bodies were left to obey their own constitutional laws, without the least disturbance from our voluntary actions or any other cause, every vital phenomenon of the system would recur at regular periods, with the exactness of a most perfect chronometer; and although the human constitution possesses a wonderful power of sustaining the disturbances of irregularity, without immediate destruction, so that, many human beings, by virtue of great natural vigor, attain to fifty, seventy, and in some extremely rare instances, even to a hundred years, in spite of many, and sometimes great irregularities, yet nothing is more true than that, the

greatest possible longevity, and the highest possible well-being of the human system, can only be secured by the most perfect physiological regularity and periodicity; and therefore, every interruption or disturbance of the physiological regularity of our systems, by our voluntary irregularities or other causes, is always, and inevitably, in some measure, injurious to the constitution,—impairs health and shortens life. Indeed, such is the importance of physiological regularity to the welfare of the body, that when it is properly observed, it will enable the system to endure other evils with astonishing power, and often for a wonderful length of time. Thus, let an individual whose voluntary habits are systematic, and which conform, in a good measure, to the natural regularity and periodicity of the physiological actions of his system, accustom himself to the use of tobacco, opium, alcohol, arsenic or any other poison, and always take the same quantity at regular periods, and it is surprising how soon the system will accommodate itself to the pernicious substance, (§ 738.) and how perfectly the habit will insert itself into the physiological economy and become, as it were, a harmonizing element of action, with which the system will work on, with little apparent inconvenience—though, always and inevitably, with more or less detriment, for forty, sixty, or eighty years. But let another individual of general irregularity of habits, accustom himself to the use of the same poison,—taking it at irregular times and in irregular quantities; and though he do not consume more in a year than the man of regular habits, yet his system will be incomparably more disturbed by it, and if he perseveres in the use of it, much more certainly will it bring on disease, and in a much greater measure abbreviate life than in the other case.

§ 1429. The physiological reason for this difference is easily given.—We have seen that the discriminating sensi-

bilities of the nerves of organic life, are soon destroyed by the use of improper substances, (§ 738.) so that, the organs acted on by such substances become, as it were, isolated in their sympathies, in a measure corresponding with the quantity and energy of the deleterious substance habitually used, and have no longer the power to give alarm to the general centre of action, (§ 228.) and rally the vital forces in powerful resistance to the offending cause, and consequently, the system suffers comparatively little from sympathetic disturbances. (§ 958 *et seq.*) We have seen also that, there is in the system a conservative and renovating economy which is continually busy in repairing the injuries which result from our voluntary improprieties and other causes. (§ 314) In the first case then, the general regularity of the individual gives greater physiological power to his whole system;—the regularity, as to time, with which he takes his poison, enables the system always to be prepared to receive and dispose of it, with the least possible disturbance and injury;—the regular quantity which he takes, is always adapted to the state of accommodation in the system, so that little sympathetic disturbance is produced beyond the part immediately acted on, (§ 960.) and the whole regularity enables the conservative and renovating economy of the system to keep pace with the depredation; so that, though the constitution always and inevitably wears out the sooner for the poison, yet it perhaps never actually breaks down with disease in consequence of it. In the second case, the contrary of all this is true.—The general irregularities of the individual, impair all the physiological powers of the system:—his irregularity as to time and quantity in the use of his poison, generally takes the system, as it were, by surprise,—continually produces extensive disturbances in the physiological actions,—often exceeds the conser-

vative and renovating economy of the organic domain, and consequently brings on disease and breaks down the constitution, perhaps long before it is worn out.—All dietetic and other irregularities by which the physiological regularity and periodicity are disturbed, are therefore, always and necessarily more or less injurious to the human constitution, and serve in some measure to impair health and abbreviate life.

§ 1430. Some individuals, as we have seen, (§ 1428.) by virtue of an iron constitution, will attain to advanced life with many improper habits; but if there be one rule in which remarkable cases of longevity agree more invariably than in any other, it is in that general regularity of voluntary habits and circumstances, which in a good measure, conforms to the physiological regularity and periodicity natural to all living bodies: and it is owing mainly, if not wholly, to the greater regularity of the voluntary habits and circumstances, that health becomes more uniform and better established in many people, in the latter part of life, than during the middle period.—Many who claim to be wise in this matter, tell us it is better to be somewhat irregular than to be too precise and punctilious in our habits.—It is undoubtedly true, that a continual mental anxiety in regard to the regulation of our habits, often does more harm than any consequent regularity of habits does good. Nevertheless, it is beyond all controversy true that, when our regularity is the result of correct and systematic education or training, and is a thoroughly established habit, the more perfect it is, the better it will be for all the physiological interests of our nature. Nay more;—it may be laid down as a general law that those individuals whose alimentary habits are, in point of regularity, most in conformity with the physiological regularity of their bodies, will not only with

greatest certainty secure health and longevity, but will also, with greatest certainty secure prosperity in their vocations and pursuits of life.

§ 1431. In the perfect health and integrity of the system, if the voluntary habits are in strict accordance with the physiological laws of the body, hunger will recur with the utmost regularity and integrity, as an indication of the alimentary wants of the vital economy; and this recurrence will constitute a physiological habitude of the system, harmonizing perfectly with all the other operations of the organic domain. But when the voluntary habits are very irregular, and the general periodicity of the vital actions of the system is disturbed, the regularity of the recurrence of the physiological condition of the stomach, the perception of which, by the animal centre, constitutes the sense of hunger, will be commensurately affected. In savage life, when the dietetic and other habits of the individual are simple and pure, and where the individual has no regular meal-times or stated times of eating, but procures his food and eats only when prompted by hunger, and greatly varies in his quantity, there will be no regular recurrence of that sensation, at particular periods, but it will take place only when the vital economy really requires that a fresh supply of food should be introduced into the gastric cavity, and the frequency of its recurrence, in such a case, will always correspond with the quantity and quality of the food received at a meal, and the amount of active exercise which the individual takes. But in civilized life, which is evidently the more natural state of man, (§ 774.) the very structure and economy of society as well as the interests and convenience of the individual, make it necessary that all the voluntary habits of man should be more regular and systematic, and therefore—if not unnecessarily artificial,

—more in conformity with the natural regularity and periodicity of the physiological actions of his body, (§ 1428.) which are not only greatly influenced by, but also, in turn very greatly influence these voluntary habits. Indeed, the physiological periodicity and habitudes of the human body, are infinitely more concerned in making man “the creature of habit,” as he is called, than he has probably ever been aware of.

§ 1432. If therefore, an individual in civic life, with a perfectly healthy and undepraved system, regularly eats, at stated periods, his three meals a day, of pure, simple, vegetable food; and uniformly takes about the same amount of exercise, and, at each meal, eats just about that quantity of food which the alimentary wants of the vital economy really demand, the physiological condition of the stomach, indicated by the sense of hunger, will become a fixed habitude, and hunger will recur at his regular periods of eating with utmost exactness and precision. But if at any time, he takes considerably more nourishment into the stomach than the real alimentary wants of the vital economy require, or omits his customary exercise or labor, hunger will not recur precisely at his next stated period of eating, and if he eats at that time, he will oppress and irritate the stomach, and trespass on the general physiological interests of his body; and by habitually continuing such transgressions, he will inevitably so affect the condition of his stomach as to bring on a preternatural appetite, which will eagerly receive food as often as his meal-time comes, and perhaps even more frequently, whether his system really requires alimentation or not; and which will never be satisfied with such a quantity of food, as the vital economy of his system can dispose of without embarrassment and oppression. Such an appetite therefore, is

something very different from that natural and healthy hunger, which is a physiological manifestation of the real alimentary wants of the body: and it is of the utmost importance that this distinction should ever be kept in view, when we are reasoning on the dietetic habits of man:—for such an appetite is no safer guide for us in regard to eating—as to time, quantity or quality —than the drunkard's thirst is in regard to drinking.

§ 1433. But again;—if a member of civic life, with a healthy and undepraved system, suffers flesh-meat to enter freely into his diet, all that I have just said of the vegetable-eater, will be true of him under the same circumstances, except that, all the effects and manifestations will be more energetic and distinct. (§ 919.) While he observes a proper regimen as to times of eating, quantity of food, and amount of active exercise, hunger will always recur at stated periods, but it will be considerably more powerful and importunate and impatient and much more tormenting if the customary supply of food is withheld at the regular periods of eating: (§ 921.)—and if he transgresses in the manner which I have described in the case of the vegetable-eater, (§ 1432.) the morbid appetite which he will produce, will be more tyrannous, vehement and voracious: and much more likely to excite all the more exclusively selfish propensities and passions. (§ 1223.) In either of these cases, if the individual adds stimulating and heating condiments to his food, (§ 1212.) he will necessarily increase the despotic energy and urgency of his appetite, which will always recur as soon as the increased exhaustion of his system demands a renewed stimulation, whether there be a need of alimentation or not. And if his stimulants are of a narcotic or poisonous character, the morbid craving will be still more distressing, violent and imperious. In such cases therefore, where

the individual is regular in his times of eating, hunger will not only recur with energy, as often as his stated times of eating recur, but it will habitually come on before the stated time of eating arrives, and be very impatient and perhaps tormenting until it is either satisfied or exhausted. For, in all cases, when hunger, at a particular time, is more the effect of physiological habitude, (§ 1432.) than the manifestation of the real and pressing need of the system for alimentation, if that time be permitted to pass by without the individual's taking any food, the hunger will subside: and this will also take place, for a single time, when the system is in a state to receive food with advantage:—and especially when the diet is simple and unstimulating.

§ 1434. This is a beautiful illustration of the systematic regularity of the physiological operations of our organic economy.—The stomach is regularly brought into a physiological condition, preparatory for the performance of its function; (§ 1426.) and whether that function is performed or not, that peculiar condition, in due time, passes away, and the vital energy which was accumulated in the gastric centre, is distributed to other parts to sustain other organs in the performance of their functions. This peculiar condition of the stomach will pass away much sooner and with much less uncomfortableness of feeling, in the pure vegetable-eater of regular habits, when the ordinary meal is omitted, than in the flesh-eater: —and he who makes a free use of stimulating condiments with his food, experiences still more inconvenience and distress at the loss of a meal, than he who eats flesh simply and plainly prepared. Hence the pure vegetable-eater loses a meal with great indifference—fasts twenty-four hours with little inconvenience, or diminution of strength,—and goes without food several days in suc-

sion, without suffering any thing like intolerable distress from hunger.—The flesh-eater always suffers much more from fasting, (§ 921.) and experiences a more rapid decline of his muscular power;* and he who seasons his food highly with stimulating condiments, feels the loss of a single meal severely;—a fast of twenty-four hours almost unmans him,—and three or four days' abstinence from food completely prostrates him, if he is cut off from all stimulants as well as aliment.

§ 1435. From the explanation before us, then, we perceive—1st, that the sense of hunger is produced by a *vital stimulation* of the nerves of the stomach, which is attended with an increase of blood in the vessels of that organ,—an elevation of its temperature, and a considerable concentration of vital energy in the gastric centre, preparatory to the performance of the function of digestion: (§ 1426.) and hence, a violent fit of anger, grief, fear, joy or any other passion, or intense excitement of the mind; (§ 1424.) or a free use of tobacco, opium, coffee, tea or any other narcotic substance, or alcholic liquors, or any other means by which the vital stimulation or exaltation of the stomach, is suddenly counteracted, will instantly destroy hunger, and subdue all desire for food. By these same means also, hunger may be completely prevented.—Thus, an individual may be kept under such a state of mental excitement, that his meal-time will arrive and he will sit down at his table without feeling any hunger or appetite for his food.—A free use of alcholic and narcotic and other stimulants, will have the same effect:—and for this reason, the Mahomedans and Jews and other oriental religionists, generally make a free use of

* It has been asserted by some writers on physiology, that carnivorous animals will fast longer without serious inconvenience than herbivorous animals, but this is erroneous: the contrary is true.

opium, tobacco, coffee, &c. during their long fasts.—In certain states of the system however, when an individual comes to his table, without any sense of hunger or desire for food, a glass of wine, if he is accustomed to it, or a little brandy and water, will serve to excite an appetite; while a more powerful stimulation of the same kind, will be sure to produce the contrary effect; and in all cases, the use of such means impairs the physiological integrity of hunger and the functional power of the stomach.—For reasons now assigned, intense mental excitement, violent anger, grief, fear, joy, &c.,—violent muscular exercise, and all other causes which serve to prevent or destroy hunger, also serve to retard or prevent digestion. (§ 454.)

§ 1436. We perceive—2d, that, that concentration of vital energy in the stomach, of which we have cognizance in the sense of hunger, brings the stomach into the best state for the reception and digestion of food; (§1426.) and if aliment be then received, the organ will perform its function with more ease and perfectness than at any other time;—but if food be entirely withheld, and the customary hour of eating be suffered to pass by without alimentation, this vital stimulation will subside,—the sense of hunger will die away, and the vital energy accumulated in the gastric centre, will be diffused over the system, or directed to some other particular organ or organs, to sustain it or them in the discharge of functional duty:—and hence, after our customary meal-time has passed by an hour or two, without our taking any food, and hunger has wholly subsided, if we then sit down and eat a hearty meal, the stomach will be embarrassed and oppressed and irritated; and, if our digestive powers are not very strong, and our system generally in vigorous health, a general sympathetic irritation of the nervous system will be produced, (§ 297.)

resulting in a disturbed action of the vascular system, (§ 312.) and more or less disturbance of all the physiological functions of the body, attended perhaps, with a burning sensation in the eyes and face, and in the palms of the hands and soles of the feet,—a heaviness and dull pain of the head,—general languor and lassitude, and commonly, very considerable thirst; and followed by a foulness of the tongue, fetidness of the breath and a disagreeable taste of the mouth.

§ 1437. We perceive—3d, that when the body is in a perfectly normal, healthy and undepraved state, and the dietetic and other voluntary habits in strict accordance with the physiological laws of the system, hunger is a true, instinctive indication of the alimentary wants of the vital economy; but habitual over-eating, and over-distention of the stomach, causes oppression and irritation and debility of that organ,—impairs the integrity of the sense of hunger as an indication of the alimentary wants of the system, and creates a preternatural appetite, which is never satisfied with such a quantity of food as the vital economy can easily and healthfully dispose of, but is continually excessive and tormenting in its demands, and if not habitually restrained, impels to that constant gluttony which inevitably brings on disease, that is attended with great distress of body and mind, and often with excruciating pains; and generally cuts off life at an early period.

§ 1438. We perceive—4th, that precisely in proportion as the stimulating quality of our food, exceeds what is necessary to the most perfect chymification of its nutrient properties, (§1433.) the energy and importunity of hunger is increased:—and precisely in proportion as the organic sensibilities (§ 301.) and sympathies of the stomach and other organs associated with it in the general function of nutrition, are depraved by the use of stimula-

ting and narcotic substances in our diet, the integrity of hunger as an indication of the alimentary wants of the system, is impaired, and the sense becomes a physiological affection, which recurs with more or less regularity, according to the voluntary habits of the individual; and often with a highly morbid and tormenting energy, and without any true regard to the real state of the system as to its need of nourishment, but almost entirely with regard to the demand of the gastric centre for accustomed stimulation; and hence, a morbid appetite or craving for food, is often felt, when the system not only does not need it, but would actually be injured by a fresh or new supply of food to the gastric cavity.—It may therefore, be laid down as a general law, that the more stimulating and heating the diet is, the more powerful and urgent will be the sense of hunger; and the more distressing and painful also, when food is withheld. Hence, as we have seen, (§1433.) hunger is more keen and urgent, in the same individual, when he is accustomed to eat flesh freely, than it is when he subsists wholly on pure vegetable food;—and still more so, when with his flesh-meat he freely uses stimulating condiments, or seasonings. It may also, be laid down as a general law, that in proportion as the stimulating properties of our customary diet, prevail over its nutrient properties, the energy and urgency of hunger will be an indication of the demand of the stomach and of the general domain of organic life, for accustomed stimulation, rather than of the real alimentary wants of the system.—Hence, the use of pure stimulants, (§ 743.) with our food, renders the sense of hunger more powerful and vehement and distressing, (§1433.) and commensurately impairs its integrity as an indication of the alimentary wants of the vital economy; and degenerates it into a demand for stimulation. All dietetic error therefore, by which the nerves

of organic life are irritated, and their vital properties impaired, and morbid irritability and sympathy induced, always increases the unhealthy energy and despotism of the sense of hunger, and proportionately impairs its integrity as an indication of the alimentary wants of the vital economy, and renders it a totally blind and exceedingly dangerous guide in regard to times of eating and quantity of food.

§ 1439. We perceive—5th, that, in the perfect health and integrity of the system, if the voluntary habits are in conformity with the natural regularity and periodicity of the physiological actions of the organic domain, that peculiar condition of the stomach which is indicated by the sense of hunger, and which specially prepares it for the reception and digestion of food, will recur at our stated meal-times with great exactness and regularity, and this regular recurrence at particular times, will soon become an established physiological habitude, and thus the ingestion of our food, or the reception of our meals, will always take place precisely when our digestive organs are prepared to perform their functions in the easiest and best manner. But as it is a law of the vital economy, always to endeavor to accommodate itself to circumstances, (§ 864.) and still adhere as far as possible to its natural regularity and periodicity, so, if one who is accustomed to take his dinner at twelve o'clock, is induced to change his hour for a single occasion, and dine at eleven o'clock —the next day at eleven, the vital economy will bring the stomach into something of that physiological condition which is indicated by hunger, and if the individual continues to eat at this hour, and his other habits correspond, the physiological condition of his stomach will soon fully and regularly recur at this hour, and become a regular habitude.—But if the individual dine one day at

twelve o'clock, the next at eleven, the next at one, the next at two, the next at twelve, &c., he will soon entirely break up the physiological habitude of his stomach; and compel that organ to perform its function to great disadvantage, and under great embarrassments, and however powerful his constitution and vigorous his health may be at the commencement of his irregularity, if he continues in such a course, he will inevitably and soon break down his digestive powers, and induce the most serious and distressing disorders.—It is true that the savage eats at greatly irregular periods, and probably without often being troubled with dyspepsy in consequence. But the cases are very different:—the civilized man who is irregular in his meal-times, eats at one time or another, according to particular circumstances or engagements, and generally, with little or no regard either to the real alimentary wants of his system or the condition of his stomach, and consequently, he is even more likely to take his food at a time when his system does not require it, and his stomach is not prepared to receive it, than otherwise; but the savage, as a general rule, eats only when he is really hungry, and when his stomach is keen for the performance of its function:—besides, the savage, with all his irregularity, seldom brings his meals too near together, which is the most common fault of civilized life. It must also be remembered that there are numerous other causes co-operating to impair the digestive powers of man in civic life, which the savage is free from. Yet after all, the savage suffers exceedingly from his dietetic irregularities. Indeed, this is one of those features of savage life, which are most at variance with the physiological laws of the human constitution, and render the savage state unnatural to man, (§774.) and greatly abbreviate the duration of life. For nothing is more true than that

the highest welfare of the human constitution, requires the utmost regularity and periodicity in all the physiological actions of the system: and therefore, man is constitutionally adapted to that state in which all his habits are regular and systematic: and in which his food is, as a general rule, taken at stated periods:—for the more perfectly regular and correct the voluntary habits of man are, the more regular and uniform will his physiological habitudes be, and, if I may so speak, the less friction and jarring will there be in the vital operations of his organic economy. (§ 1428.)

§ 1440. The important positions, therefore, which physiology determinately establishes in relation to the question before us, and by which our reasonings and conclusions must be governed, are these; viz. 1st, the sense of hunger is a true instinctive indication of the alimentary wants of the vital economy, and is a safe guide in regard to times of eating and quantity of food, only while the system is in a perfectly healthy and undraped state: but all deviations from a strictly natural diet, and all habitual excesses in quantity, necessarily, to a greater or less extent, impair the integrity of the sense, and render it a treacherous and a dangerous guide,—and such deviations and excesses are nearly universal in the human species, and especially in civilized life, and therefore, as a general rule, little dependence is to be placed on the sense of hunger, as an indication of the alimentary wants of the system; and particularly in relation to quantity.—2d. Our meals should not be taken so irregularly as greatly to disturb the natural periodicity of the physiological actions of the organic economy, and prevent the regular recurrence of that condition of the stomach which is indicated by hunger, and which specially prepares the organ for the performance of its function. (§ 1426.)—

3d, Our meals should not be so seldom or so far apart, as to require an over-distention of the stomach, when we do eat, in order to receive food enough to answer the alimentary wants of the system.—4th. Our meals should not be so frequent, or so near together, as that the food received into the gastric cavity at one time, is not fully digested before another portion is taken.

§ 1441. With these well ascertained positions to govern our reasoning, we can arrive at particular conclusions in regard to times of eating, with all the accuracy and certainty that the physiological welfare of the human body requires.—Some portions of the human family eat but once in twenty-four hours: and where the habits and circumstances are in all other respects simple and favorable to health, and the food is nourishing and unstimulating, the digestive organs will readily adapt themselves, in capacity and power, to such a habit, (§ 338.) so that, man in a simple state of society, where there is little regular and systematic employment of the voluntary powers, and where the intellectual faculties are little cultivated or exercised, will enjoy more uniform health and attain to greater age, than he would in a more cultivated and artificial state of society, if he took his meals too frequently.—But in civilized life, where the constitution and relations of society demand of every member, some regular employment of his voluntary powers, and a considerable cultivation and exercise of his intellectual and moral faculties, one meal a day would require too large an appropriation of the physiological powers of the body, to the gastric function during the process of digestion, and too protracted an interruption of voluntary employment and intellectual exercise, to be compatible with the individual and social interests of man:—and if by continued voluntary employment and intellectual exercise the appro-

priations of vital energy to the stomach, should be diminished, the functional power of that organ would soon be broken down. It is fully evident therefore, that the regular habit of taking but one meal in twenty-four hours, is not best adapted to the physiological and psychological interests of man. Hence, it may be considered as a general rule, inductively established on physiological principles, that man cannot take less than two regular meals a day, consistently with the highest permanent physiological and psychological welfare of the human constitution.

§ 1442. We have seen (§ 439.) that, some kinds of food pass through the stomach much more slowly than other kinds, and that, the stomach of one individual differs from that of another, in regard to the time employed in the process of gastric digestion, and even the same stomach varies in this respect, very considerably, with the varying circumstances and conditions of the individual.—We have seen also, (§ 920.) that, in the true physiological sense of the terms, the ease or difficulty with which a particular kind of food is digested, is in no measure determined by the time in which that kind of food is passing through the process of the stomach:—for, although some kinds of food pass through the stomach much more rapidly than others (§ 921.) yet the chymification of them actually causes a greater expenditure of vital power and waste of organized substance, than the digestion of other kinds of food which are much longer in undergoing the same process.—Again, we have seen (§ 320.) that the grand function of the alimentary cavity, as a whole, is the converting of the food into that partially assimilated substance called chyme, and presenting the chyme to those organs (§ 388.) which elaborate the chyle from it, and conveying the faecal matter from the

body: and that the chymifying process is continued through the whole length of the small intestine, (§ 456.) and perhaps to some extent in the large; and therefore, that the most perfect performance of the functions of the small intestine, including both chymification and chylification, requires that the stomach should not be actively employed at the same time with a fresh supply of food:— or in other words, the physiological welfare of the system, requires that the entire alimentary cavity should complete its chymifying process on one portion of food, before another meal is received. Moreover, the stomach requires a time to rest and to recruit its energies after it has completed its function, which should be of greater or less duration, according to the degree of exhaustion which it has suffered from the performance of its function. Mild, unstimulating, vegetable food passes through the stomach slowly and leaves the organ comparatively little exhausted from the performance of its function; (§ 1025.) while flesh-meat, as we have seen, (§ 920.) passes through more rapidly, and leaves the organ much more exhausted, and consequently, the stomach really requires a longer time to rest after the digestion of flesh-meat, than after the digestion of farinaceous food. Yet as flesh-meat works the whole vital machinery more rapidly, (§ 919.) and is much more stimulating in proportion to the quantity of nourishment which it actually affords the system, hunger returns at shorter periods and more vehemently (§ 921.) in the flesh-eater than in the vegetable-eater, and the flesh-eater can habitually take his meals more frequently than the vegetable-eater, without serious inconvenience to his digestive organs in particular; but the general increased action of his vital economy, will wear out his constitution in a shorter time. (§ 925.) So that, all things considered, whether man subsists on

one kind of food or another, the permanent physiological welfare of his system requires that, about the same length of time should come between his regular meals.

§ 1443. Where farinaceous vegetable food however, constitutes a considerable proportion of the diet, and man is not stinted in the quantity of his aliment, the digestive organs must have their proper time for the performance of their function, or serious disturbances and disorders will soon result. And, as a general rule, when an ordinary meal is taken, the stomach cannot perform its function in the best manner for itself and the whole system, and have sufficient time to rest, and also allow the small intestine a proper opportunity to carry forward its assimilating processes, without disturbance, in less than *six hours*. I speak with all the authority of indubitable truth therefore, when I say that man cannot habitually take his meals more frequently than once in six hours, without serious detriment to his constitution,—without necessarily shortening his life,—without inevitably afflicting himself with disease of some form or other, sooner or later. It is true that civilized man habitually violates this rule: and it is true that he experiences the bitter consequences!

§ 1444. I know that many naturally vigorous constitutions will bear up under this oppression, in some cases, for many years, in the enjoyment of what the world calls health: but however powerful the constitution and however long it endures such oppressions without actually breaking down, the existence of nature is not more certain than that the habitual taking of food more frequently than once in six hours, is injurious to health and destructive to life.—Be it remembered however, that this is stated as a general rule, in regard to man in ordinary health, and who is not stinted in his alimentary supplies,

or who takes as much food as his system requires at each meal.—It is also equally certain, as we shall see hereafter, (§ 1450.) that we cannot habitually take food at a very late hour in the day, without encroaching upon our proper sleeping hours, and thereby inevitably impairing the soundness of our sleep and preventing its refreshing and invigorating effect.—Hence, it may be considered as a general rule, inductively established on physiological principles, that man cannot habitually take more than three meals a day, consistently with the highest, permanent, physiological and psychological interest of the human constitution.

§ 1445. Many portions of the human family have, from the earliest times, been accustomed to take but two regular meals a day: and this was the habit of some of the wisest philosophers of antiquity. Indeed, Socrates used to teach his disciples that they who ate more than twice a day, were barbarians.—It was the prevailing custom of the most civilized nations in the days of Greece and Rome, to take a light and simple meal in the fore part of the day, and to make the principal meal or supper, near the close of the afternoon, after the cares and duties of the day were completed; and from supper till the hour of sleep, the time was devoted to relaxation, social enjoyment and amusements.

§ 1446. This regulation is far more conducive to health and longevity than our modern custom of crowding every thing together, and compelling the digestive organs, the voluntary muscles, and the brain, all to perform their functions at the same time, and thus embarrass and worry each, and prematurely break down the whole. It is incomparably better to eat but two meals a day, than either to eat more frequently than once in six hours, or to hurry from the active employments of mind and

body, to our meals; and from our meals back to our active employments;—and this is particularly true of those members of civic life, whose employments are attended with much exercise and excitement of the mind. (§ 303. 520.)

§ 1447. Merchants and all others, whose labors are more mental than physical, and draw more largely on the energies of the nervous, than the muscular system, would be immensely the gainers in every respect, if they would, as a general regulation, close up the business of the day, punctually at three o'clock in the afternoon,—lay all their cares aside, and suffer the vital energies which have been accumulated in the brain, to be diffused throughout the system, or concentrated in the gastric centre, and thus, by a conformity of their voluntary habits to the physiological laws of their bodies, (§ 1428.) suffer their stomachs to prepare themselves for the performance of their function, (§ 1426.) and sit down to their principal meal at four o'clock; and eat slowly and with cheerfulness; and devote the remainder of the evening to relaxation,—to social enjoyment,—to reading, and to the light avocations pertaining to domestic and social life; and at eight o'clock in the morning, breakfast on plain, simple and nourishing, but unstimulating food.

§ 1448. To those who are accustomed to take their three regular meals, and their lunch at eleven o'clock, such a regulation as I now propose, undoubtedly appears intolerable: and it certainly would be intolerable to them, if they continued the same diet that they are now accustomed to. But let them lay aside all their stimulating meats and drinks and condiments, and accustom themselves to subsist mostly or entirely on a plain, nourishing diet of farinaceous substances and fruits, and in a few months, if their habits are in other respects correct,

they will, with utmost certainty, find that they can go from their eight o'clock breakfast to their four o'clock supper with infinitely less "*sinking*" and "*gnawing*" of the stomach and teasing of the appetite, than they now experience, and that they can perform the duties of the day, however laborious, with vastly less fatigue and exhaustion of body and mind, than they suffer at present. Besides, with such a regulation properly carried out, they would not only enjoy themselves much better while acquiring their wealth, and with much greater certainty succeed in their pursuits of life, but—what is of no small consideration in this age of wealthy dyspeptics and hypochondriacs—they would with much greater certainty, be able to enjoy their wealth after they had acquired it.

§ 1449. Agriculturists, mechanics, and others, whose employments draw more largely on the muscular, than on the sensorial powers of the body, have generally more vigorous digestive organs, and do not by their employments, detract from the energies of the stomach, so much as the class of men I have just spoken of. Besides, as a general rule, their active, muscular exercise is more conducive to the decomposing (§ 314.) and eliminating functions of the body; (§ 509.) and therefore, they can take more food, and suffer their meals to come somewhat nearer together, without injury. But the hardest laboring farmer or mechanic ought not, as a general habit, to eat more frequently than once in six hours; and then he will be far more likely to take too much than too little nourishment.—In this country, as a general fact, laboring people impair their muscular powers and break themselves down more frequently, by eating too often and too much than by any other means. (§ 805.)

§ 1450. If due regard be paid to the physiological principles which should govern our sleeping hours,

(§ 1444.) we ought certainly, as a general habit, not to take a meal later in the day than six o'clock P. M.:—and taking this for an established point, if we make three meals a day, it will fix our regular periods at six o'clock A. M., twelve M., and six P. M., and these are undoubtedly the very best periods that can be fixed on if we take three meals a day. If we would regularly rise at four o'clock in the morning, breakfast at six, dine at twelve, and sup at six, and always be moderate in our quantity, and never suffer the mental anxieties and nervous excitements of our business or vocation to trouble our meal-times; nor interfere with our digestive powers, it would probably be best for us—and especially if our habits are active—to take three regular meals a day;—or in other words, it would probably be better for us to take a sufficient quantity of food to sustain our bodies, at three meals, six hours apart, than to take the same quantity at two meals eight hours apart.

§ 1451. But if we cannot make our three meals a day, without eating oftener than once in six hours, and without encroaching too much upon our proper time of sleeping, and without being obliged to hurry from the excitements of business to our dinner, and from our dinner to the excitements of business, it is incomparably better to limit ourselves to two meals a day.—I speak with great earnestness on this subject, because it is of immense importance to the welfare of mankind!—The evils which result—the sufferings which are produced by eating too frequently—by bringing our meal-times too near together, are actually incalculable!—I am confident that this is one of the greatest sources of affliction to civilized man. By the habitual ingestion of one portion of food into the stomach, before the previous portion is fully disposed of, the digestive organs are embarrassed, their functions are disturbed, the

whole system is worried and debilitated, all the assimilating processes of the body are deteriorated, indigestion, with all its train of distressing symptoms, is induced, and diseases of every type and character are caused.—Nor should we, for the sake of securing our three meals a day, and keeping them at a proper distance from each other, be induced to suffer our third meal habitually to come nearer to our sleeping hour than six o'clock. Some writers on hygiene have indeed, insisted with much force, that we ought not to eat later in the day than five o'clock: and were this to be the principal meal, as in early times, (§ 1445.) the position would undoubtedly be correct.

§ 1452. But where three meals are taken in a day, the third one should always be very light and simple, and the food should be mild and unexciting, and in this case, six o'clock would be sufficiently early to allow the digestive organs time to advance so far in the performance of their function, before the regular hour of retirement arrived, as not to impair the perfect soundness and refreshing effect of sleep.

§ 1453. I know that, thousands of people in civic life, are in the habit of eating hearty suppers just before they retire to rest;—and I know too that by virtue of powerful constitutions, and perhaps, much active, out-door exercise, there is, occasionally, an individual among such people, who enjoys a tolerable share of health, and attains to seventy or eighty years of age:—but I also know that, ninety-nine in a hundred of those who indulge in this practice, are broken down, and afflicted with chronic disease before they reach fifty years: and a large majority of them are in their graves before they are forty years old.—I am aware also, of the objection raised by some, that the lower animals usually fill their stomachs and then lie down to rest:—there is a vast difference

however, between lying down to rest, in the manner of the lower animals, and going to sleep as man does. Few animals sleep immediately after lying down. The ruminating animals, we know, remain hours in a wakeful state, after lying down: and although carnivorous animals are much more stupefied by what may almost be called the narcotic effects of their food, yet there is reason to believe that they rarely, if ever, sleep soundly during the first stages of gastric digestion. Moreover, it should be remembered that no strict analogy can be instituted between the lower animals in a state of nature, and man in civic life:—for, as we have seen, (§ 1262.) nearly all the circumstances and habits of civic life serve to impair the physiological powers of the human body, and particularly to debilitate its digestive organs and to produce and keep up an unhealthy irritability in the nerves of organic life (§ 228.) and a preternatural sympathy between the digestive organs and the brain.

§ 1454. If man were in a truly natural and healthy state, and always subsisted temperately, on a mild, unirritating and unexciting diet, and preserved the nerves of organic life in a perfectly healthy condition, and never over-excited and over-worked the brain, he might undoubtedly, like the young infant, go to sleep on a full stomach, with comparatively little physiological disadvantage to his system. But in civic life, where a high degree of sympathetic irritability universally exists between the brain and stomach, the case is very different, and renders it impossible for man to habituate himself to such a practice, without seriously embarrassing the functions of the vital economy and increasing greatly, his liability to disease and untimely death.

§ 1455. On the whole then, it appears very evident that if we take three meals a day,—six o'clock in the

morning, twelve at noon, and six in the evening are the very best periods we can fix on for our meal-times:—and if we regularly rise at four, and never later than five o'clock in the morning, and avoid having the toil and cares and anxieties and excitements of our business or vocation, encroach too nearly on the dinner hour, it is probably, as a general rule, better to take three moderate meals a day—and especially if our habits are active—than to take the same quantity at two meals. But if we cannot take three meals a day without bringing them nearer together than six hours,—or if we cannot take three meals a day without being obliged to hurry from the bodily and mental toil and excitements of business to our dinner, and eat with great rapidity, and hurry back to the bodily and mental toil and excitements of business, we had infinitely better take but two meals a day, under the regulations which I have named. (§ 1447.)—At all events, if we are wise, we will, as a general habit, keep our meal-times at least six hours apart.—This is so important a regulation, it can hardly be too much insisted on.

§ 1456. But whether we take two or three meals a day, or whatever hours we fix on as our stated times of eating, it is of great importance to our welfare as individuals and as members of society, that we should regularly and punctually take our food at those hours; and, as a generale rule, with as little variation as possible; for by so doing, if our habits are in other respects correct, we shall soon establish such a healthy physiological habitude of the digestive organs as will always secure to us a good appetite for our food, and that condition of our stomach in which it is best prepared for the performance of its function. (§ 1426.)

§ 1457. If by any means however, we are, on some

occasions, obliged to pass by our regular meal-time, without taking any food, till our hunger has subsided and the attendant physiological condition of the stomach has passed away, it is, as a general rule, far better to defer eating till the next regular meal-time arrives, and our hunger again recurs. But in such a case, it is important to remember that we ought not, at our next meal, to make up for the one which we have lost, by eating a quantity sufficient for two meals, at once.—Nothing, perhaps, is more common, when an individual in health has, by any means, been detained from his dinner, than for him to sit down to the supper, or as it is commonly called, the *tea-table*, and eat his dinner and supper both at once; and then, in due time, he retires to rest; and rises in the morning, and wonders why he has had such a poor night's rest, and why he feels so little refreshed from sleep, and why he feels so languid, and why his eyes are red, and his tongue coated, and his breath foul; and why his mouth tastes bad, and why his head aches. Such an individual, and every body else, should know that, all these unpleasant symptoms result from the oppression and irritation of the system caused by the improper quantity of food taken at supper.

§ 1458. Every body should understand and remember that the digestive organs partake, in a considerable measure, of the general fatigue and weariness of the body, and have less functional vigor in the latter part of the day, than in the earlier part of it: and therefore, when the dinner has been lost, the supper had better be lighter than usual, rather than heartier; and then the night's rest will be sweet and refreshing, and in the morning, the body will be vigorous and elastic, and the spirits cheerful.—And, as a general rule, in all cases when a meal is lost, the next meal should not be more full, but on the

contrary rather lighter; and then, the occasional loss of a meal will, perhaps in every instance, prove beneficial, or at least not injurious.

§ 1459. In these remarks however, I only contemplate those members of civic life, who have abundance of food, and who habitually eat full as much as the alimentary wants of the vital economy demand; those who from poverty, or other causes, are compelled to be extremely abstemious, and never exceed, and rarely satisfy their alimentary wants, cannot be benefited by losing a meal. Yet even in such extreme cases, the loss of one meal would be ill repaired by the reception of such a quantity of food at the next meal-time, as would oppress and embarrass and irritate the stomach, and through it, the whole system. When the regular recurrence of hunger distinctly indicates that physiological condition of the stomach, which is a manifestation of the alimentary wants of the system, and which prepares the organ to receive and digest the proper supply of food, it is probably always true, except in a decidedly morbid condition of the stomach, that the loss of a customary meal results in more or less of indirect debility of the digestive organs; and hence, when hunger again recurs at the next succeeding meal-time, the stomach requires a lighter, rather than a heavier task than usual.

§ 1460. When the regular meal is made and finished, then the stomach should always be left to perform its function without any disturbance or embarrassment.—In strict propriety, not another mouthful of food, of any kind, should be swallowed, till this is done.—Many people are in the habit of eating but little at the regular meal-times, and of taking a few mouthfuls every hour or two between meals;—and I believe that such people

almost invariably complain of ill health, and most of them are dyspeptic:—and well they may be, for there are few practices which serve more directly and powerfully to irritate and vex, and break down the stomach, than that of disturbing and interrupting its function by constantly introducing small quantities of food into it, at all hours of the day, and with the utmost irregularity. By such means they inevitably disturb and finally break up the regular physiological habitude of the stomach; (§ 1431.) and, by taking food when that organ is not in a proper condition to receive it, they harass and irritate, not only the stomach itself, but also, to a greater or less extent, every other organ in the system. (§ 521.)

§ 1461. Men of vigorous health and good digestive powers, may indulge in this injurious practice for a while, without being conscious of any evil effects, but they greatly deceive themselves if they think to indulge in this irregularity with impunity. For, powerful indeed, are the digestive organs of that individual, who can long continue in such a practice, without finding himself seriously afflicted with dyspepsy or some other form of chronic disease. Hence, it is often found, as Dr. Paris justly observes, that, distressing cases of dyspepsy may be entirely cured by no other remedial means, than a regular and strict observance of stated periods of eating.—Nor let it be supposed that I draw my rules from the experience of dyspeptics, and that therefore, my reasonings on this point, are only applicable to dyspeptics and other invalids:—all my reasonings are founded on general physiological principles established in human nature, and therefore, they are applicable to all mankind,—except in so far as I avowedly accommodate them to man in civic life:—and even in this, I am always guided by physiological principles:—and consequently, though every one in

the same general predicament, may not have the evidence of precisely the same symptoms in his own experience, to corroborate my statements, still my principles and reasonings are none the less true in relation to all.

§ 1462. If by reason of having taken too much food at the previous meal-time, or in consequence of neglecting the customary exercise, or from any other cause, a regular meal-time arrives without the recurrence of hunger, and without any evidence of that physiological condition of the stomach which indicates the alimentary wants of the system, (§ 1426.) and especially, if there be reasons to believe that the stomach has not entirely disposed of the previously ingested food,—it is best, by all means, in such a state of things, to abstain from eating, and take no more food till the next regular meal-time arrives:—for by taking food in such a case we shall only irritate and debilitate the stomach, and worry the whole system;—and by persevering in such a course, we shall soon be visited with acidity and other symptoms of indigestion.—If, by any means, they who live on a simple diet, experience acidity and other symptoms which indicate functional embarrassments and derangements of the stomach, and which are most frequently caused by eating too often, too fast and too much, the most certain as well as the safest remedy is to lose a meal, or perhaps, fast a day, and then return to the regular meals, more guardedly,—making them considerably lighter at first:—for, it should ever be remembered as a most important physiological law, that a fast should never be broken by a very full meal; but the first one, two or three meals after a fast—and always in proportion to the duration and severity of the fast—should be lighter than usual.

Dietetic Regularity of Children.

§ 1463. In the management of children, it is of the highest importance that strict regularity and punctuality should be observed in regard to their times of eating. Because the springs of life are so elastic in them, and they seem to recover so promptly from the little ailments with which they are occasionally afflicted, parents generally, have no conception of the evils which result to the constitutions of their offspring, from those habitual transgressions of the physiological laws of their systems, in very early life, which are attended with no immediate and strongly marked manifestations of suffering or disease. But there is a deep delusion on this subject, pervading the whole human family. In all cases perhaps, when mankind observe an effect, they look for an immediate cause; and generally fix on something whose proximity to the effect, is such as to satisfy them of the immediate relation of the one to the other:—and here they generally leave the matter, without any farther investigation. This same mode of reasoning is universally applied to those physiological and pathological phenomena or symptoms, which mankind take cognizance of.—If a person experiences any ailment, he immediately looks around him for some fact, event, or circumstance, which he may fix upon as the cause of his indisposition:—and accordingly, while he experiences no ailment, he confidently concludes that no cause of indisposition exists in the circumstances or habits or events of his life:—and hence, in pursuance of this same mode of reasoning, while children are able to eat and drink, without any regulation as to the quality or quantity of their food or their times of receiving it, and do not manifest those immediate and unequivocal symptoms of disease, which compel their

parents to see the relation between them and their dietetic habits, the parents will not be convinced that any thing in their dietetic habits is wrong.

§ 1464. But, if the truth were universally and clearly understood, that except in cases of direct violence, almost every instance of disease and suffering in the human family, is gradually and slowly brought on, not by the action of any one cause for a single time, but either by the constant and continued action of some one cause, or by the combined action of many causes, for a considerable time, and probably in most cases, for a great number of years, before those symptoms are perceived, which are generally regarded as the first evidences of a disease, or at least, a disordered state of the system, then parents and others would know that, many causes in the dietetic and other habits of children, may be operating to impair and to destroy their constitutions, while they are able to perceive no symptoms of disease in their little bodies: and then also, would people know that, those distressing symptoms which they suffer in later periods of life, are far less the effects of those immediate causes to which they attribute them, than of those causes which have been operating, perhaps from the very hour of their birth.

§ 1465. Every thing in the state of the human system, in early childhood, renders it peculiarly liable to be injured in such a manner as permanently to affect the constitution, by every cause that disturbs the functions of, or produces irritations in the growing body:—and parents can therefore, hardly be too careful in the regulation of the dietetic habits of their offspring;—nor too precise and punctual in their times of eating.

§ 1466. The error which prevails on this point, is so universal and so inveterate, it is necessary that I should speak of it in strong terms of disapprobation. In most

families in our country, children, from their birth till they go from under maternal care and misguided fondness, are permitted to take food into their stomachs, at any and every hour of the day, just as a wayward fancy or nervous restlessness, or capricious appetite shall dictate. But this is all wrong,—decidedly and cruelly wrong.— Every particle of aliment taken into their stomachs, must be digested, as well as that received into the stomachs of adults; and their tender and delicately susceptible organs even more than those of adults, require their proper time for the undisturbed performance of their functions and their proper time for repose: (§1442.) and to perform their functions healthfully, and vigorously, and with least exhaustion to themselves, those little organs require that, every physiological advantage which nature has provided for them, or can supply them, should be possessed:—and we have seen how beautifully and benevolently God has ordained that peculiar physiological condition of the stomach, of which we have cognizance in the special sense of hunger, and which indicates the alimentary wants of the vital economy and prepares the stomach to receive and digest the proper supply of food. (§ 1426. 1427.)

§ 1467. Now then, if in the fully developed and vigorous body of an adult, it is of great importance, that strict regard should always be had to this physiological condition of the stomach, in the reception of our food and times of eating, of how much more importance is it, that these things should be attended to in the management of children, whose delicate systems are easily disturbed, and every disturbance of which, modifies in some degree the very elements of their constitution, and the development of their bodies?—Depend upon it, it is not easy to overstate the importance of the strictest and most punctual regularity in the times of children's receiving their food.

§ 1468. From the first hour of life, this matter is of

the highest importance, in rearing and educating our children. If they be nursed or fed, whenever they are restless, or whenever an ignorant nurse or mother takes a notion that they require it; or be supplied with food as often as they choose to ask for it, and be permitted to be swallowing something that requires digestion, at all hours of the day, without the least regard to order or regularity, as to times of eating, or the condition of the stomach, how can their digestive organs perform their functions without continual disturbance and irritation? and how can their stomachs become established in that regular physiological habitude, (§ 1431.) which is so essential to the most vigorous and perfect performance of their function; and permanent interests of the vital economy? And if such oppressions and irritations of their tender and susceptible organs, be continually kept up, can it be surprising that they should be restless and fretful, and frequently indisposed? or that they should often be afflicted with those distressing and violent complaints which in so many instances, and so suddenly, send them to the grave, in the very budding of their existence?

§ 1469. They who have never tried the experiment of strictly regulating their children in their times of eating, can have no just conception of the salutary and happy effects of such a regulation. I repeat that, it should commence from the very first hour of life, and continue so long as our children are under our care: and we ought to endeavor to establish their habits so firmly in childhood, that they will not afterwards depart from them.

§ 1470. In the earliest stage of infancy, children undoubtedly require nourishment more frequently than full-grown people. Yet it is in no degree less important, that they should be nourished at regular and stated times. How often a young infant needs to be nourished, is a ques-

tion about which there is some difference of opinion among writers. But there is no reason to believe that their little stomachs will dispose of a suitable portion of their appropriate food, in a much shorter time than is required for the stomach of an older child to digest the same kind of aliment:—and hence, I am confident that I am perfectly safe in saying that, as a general rule, once in three hours, is as often as an infant should be nourished. And mothers and nurses, that are truly wise and humane, will fix the hours of nursing, with great precision, and observe them with great punctuality; and they will be sure to receive their reward, in the quietness and health and cheerfulness of their children.—But to nurse them every half hour or every hour, till their little stomachs become oppressed and irritated, and they throw up their food, which is often in a state of acidity, and worry and cry, from the irritation and distress thus caused, and then to nurse them again to stop their crying, is cruel beyond measure; for it not only distresses them for the present, but it is blending with the very elements of the constitution the principles of disease for after-life.

§ 1471. When children are old enough to receive solid food, they should either eat four regular meals a day at stated periods, from four to five hours apart, or, like adults, eat three regular meals a day at stated periods, six hours apart; and with the same regularity and precision, be permitted to take a little plain, simple food, or good, ripe fruit of a proper kind, just mid-way between their regular meals. This practice may be continued till they are four or five years old, if they take considerable active exercise in the open air, and if their regular meals be light. But if their habits are inactive and sedentary and studious, more caution must be used both in regard to quantity and frequency of eating. Still

however, the grand point which I now wish to make most prominent is that, whether they eat at a greater or less number of times, they should, as a general rule, only eat at those stated and precise times, and never be allowed to take a morsel of food at any other time.—If this rule were strictly observed, and the meal-times of children properly regulated, as to frequency, according to their age, activity, vigor, &c., it would save childhood, as well as after-life, from an immense amount of evil and suffering.

§ 1472. Every one who hast he care of children, ought to know that, if they be permitted to eat very frequently and with great irregularity they will very soon be habitually tormented with a craving appetite, which, like the drunkard's thirst, is the more importunate and distressing the more it is indulged. Children of such habits are always far more unhappy and fretful and ill-tempered and unmanageable and liable to disease, than they would be if their dietetic habits were properly regulated. Some few of them, with good natural constitutions, by virtue of much active exercise in the open air, survive the perils of such a childhood, and perhaps never realize the bitter consequences of their early transgressions, till they have attained to adult age, and possibly, not till they have reached the middle period of life; but a large majority of them, are cut off by disease in some form or other, before they are ten years old. It is therefore, not kindness, but abiding cruelty in parents, to beget and pamper such an unhealthy and mischievous appetite, which, like the consumption, seldom fails to destroy its victim, and which children of well-regulated habits never know.

Dietetic Regularity of Aged People.

§ 1473. Systematic regularity and punctuality in re-

gard to times of eating are hardly less important for aged people than for children. As old age advances, there is, even in the best ordered life, a gradual abatement of the physiological powers of the system; (§ 688.) the digestive organs, with equal pace, diminish in functional vigor; and there is a correspondent diminution in the alimentary wants of the vital economy; and all the vital processes of the system take place with slowly decreasing energy and rapidity. The necessary consequence is that, as man becomes old, his system is less able to endure sudden and violent changes of any kind; and less able to maintain a general regularity of physiological functions, when there is considerable irregularity of voluntary habits. The stomach whose functional energies are impaired by age, requires all the advantages which the best condition and circumstances of the system to which it belongs, can afford it, in order to perform its function in such a manner as will best sustain the interests of that system:—and hence, it may almost be asserted as a general law, that great regularity of the voluntary habits, is essential to the continuance of life in old age:—and amongst the voluntary habits, there are few of more importance to the physiological interests of the body, and the comfort of the individual, in old age, than systematic regularity and punctuality in times of eating. Indeed, as I have said, (§ 1430.) there is reason to believe that a principal cause why health is generally, so much less fluctuating, after certain periods of life than before, is that the physiological habitudes of the body, are so much less disturbed by the irregularities of the voluntary habits; and especially those connected with alimentation.

§ 1474. They who love their parents then, and who count it one of the richest blessings of this life, to have those beloved parents long continue with them in the en-

joyment of health, the objects of their gratitute and affectionate duty, should study to do all in their power, to secure the utmost regularity to their voluntary, and especially their dietetic habits.

LECTURE XXIII.

Quantity of food necessary to sustain the human body—Excessive alimentation may be sustained in high health at the imminent hazard of life, during the whole growth of the body—An uncommonly powerful constitution may maintain health in excessive alimentation for seventy or eighty years without actually breaking down with disease, but it always shortens life, predisposes to disease, and almost invariably produces it, even in the soundest bodies, and inevitably, where there is a natural predisposition to it—Particular effects of excessive alimentation—Excessive alimentation the greatest source of evil to man—Gluttonous propensity and practice of man—Difficulty of controlling it—Difficulty of laying down general rules as to quantity—The only safe general rule that can be given—Appetite a blind guide—Quantity of food for children, and for aged people—General conclusions in regard to food—Drink, why required and what kind, and how best supplied—Thirst, how far a true indication of the want of the vital economy—Morbid thirst, how produced, and what it indicates—Excessive drinking of water or any other liquid, the effects—Effects of impure water—Mineral waters, &c.—How to secure good water—Pure stimulants—salt, pepper, mustard, &c., tea, coffee, alcoholic liquors, tobacco, opium, &c.—Their effects on the system and the general delusion concerning them.

Quantity of Food.

§ 1475. IN regard to the quantity of food which the human body requires, there appears to be far more truth in the speculative opinions than correctness in the prac-

tices of the civilized portions of the human race. It is a common saying that it is comparatively unimportant *what* a man eats or drinks, so that, he is strictly temperate in his *quantity*: and the principal objection to this proverb is that it is almost universally made to justify an indiscriminate indulgence of appetite rather than to prevent or discountenance excesses in quantity.

§ 1476. We have seen (§ 314.) that the matter of which our bodies are composed, does not remain permanently in its organic arrangement during our corporeal existence, but, by the two great vital processes of composition and decomposition, particle by particle of new matter, is continually added to the several structures and substances of the body; and particle by particle of old matter, is continually abstracted from the several structures and substances, and ultimately eliminated from the vital domain. (§ 516.)—It is to sustain this great process of composition, or general function of nutrition, that food is required by the vital economy, and is constantly introduced into the alimentary cavity, and by the vital processes of assimilation, converted into chyme, chyle, blood, &c.; and it is to sustain the great processes of decomposition and elimination, that certain voluntary and involuntary actions are constantly required.

§ 1477. By the varying circumstances and habits of individuals, the relative activity and vigor of the two great processes of composition and decomposition are correspondingly affected, to a certain extent; so that, the general bulk of the adult individual, may be several pounds more or less, at different times, consistently with the general integrity of function in the system. And as it is a physiological law of living bodies, that each part is nourished and sustained according to its duties and its healthy action, (§ 376. 393.) so particular members or

parts of the system, may be considerably more developed at one time, than at another; (§ 1019.)—but as a general law of the vital economy, the two great processes must necessarily balance each other, within certain limits, or integrity of function is destroyed, health impaired, and life abbreviated. (§ 509.)

§ 1478. During the healthy growth of the body, the great process of composition or general function of nutrition is necessarily somewhat in excess of the processes of decomposition: yet even at this time, the relative activity of the two great processes, is strictly determined by the physiological integrity of the system, according to fixed and precise constitutional laws; so that, no considerable permanent deviation can take place, without injuring the constitution, impairing health and abbreviating life. The process of composition may be too rapid or too languid for the welfare of the constitution. When the constitution is vigorous however, excessive nutrition may take place through the whole period of growth, without any distressing symptoms of such excess; and the individual may be regarded as the personification of health, while at the same time, the whole course of his life, runs fearfully close to the line of active and violent disease, (§ 649.) and he is, with the certainty of necessity, abridging the period of his earthly existence, and generating the elements of disease, which will sooner or later manifest themselves, with more or less of violence and pain, according to his subsequent habits of life.

§ 1479. After the body has attained to its full size, or ceased to grow, there must be a general equilibrium, or balance of action between the great processes of composition and decomposition—of incorporation and elimination—of ingestion and evacuation, or all the physiological interests of the system must suffer,—health must be

jeopardized and life shortened.—The bulk and weight of the body, as I have said, (§ 1477.) may vary, with varying circumstances, to a very limited extent, consistently with the general integrity of function in the vital economy: but no considerable variation of this kind, can take place, while the proper balance of action is maintained in the system: and therefore, whenever the general bulk or weight of the body is either considerably increased or diminished from the perfectly normal standard, it is an infallible evidence of unbalanced and unhealthy action in the system, and cannot long be continued without serious detriment to the constitution and hazard of life.

§ 1480. In a healthy body, the general processes of decomposition and elimination, take place more or less rapidly and freely, according as the individual is more or less active and athletic in his habits; and as a general law, the assimilating organs correspond in functional vigor and activity: and hence, as we have seen, (§ 1449.) the robust, active laborer requires more food than the sedentary man, and can receive and digest more with ease and comfort. But in all cases, if more food is taken into the alimentary cavity, than is just sufficient to answer the real alimentary wants of the vital economy and balance the easy and healthy action of the decomposing and eliminating organs, injury is inevitably done to the system.

§ 1481. In a vigorous body, where all the organs are well balanced, and no one of them is predisposed to any particular disease, the vital economy as a whole, applies its power according to the general or particular demands of the system, and this aggregate power of the vital economy, always corresponds with the average power of the several organs composing the system. (§ 1105.) If therefore, in such a state of the system, more nourishment is received into the vital domain than is really demanded by the ali-

mentary wants of the vital economy, the decomposing and eliminating organs will be excited to proportionably increased action, so as to preserve the general balance between the two great processes of composition and decomposition:—and if the constitution is uncommonly vigorous, and the several organs well developed, and wholly free from particular predispositions to disease, and the general habits of the individual are active and invigorating, and mainly favorable to physiological power and health, excessive alimentation may habitually take place for forty, sixty or eighty years, and perhaps even longer, and the general balance between the two great processes be so perfectly preserved, by the correspondent over-working of the decomposing and eliminating organs, that no consequent morbid results will ever be experienced, which will determinately indicate their true cause, or unequivocally denote an excessive alimentation.

§ 1482. Hence, it is almost universally believed that so long as an individual enjoys health, he is not injured by habitually eating more than is really necessary for the healthy nourishment of his body: (§ 1255.) but this opinion is utterly and dangerously false!—It is indeed, one of the most mischievous errors entertained by the human mind. For there is nothing in nature, more true—more certain than these propositions,—viz.—1st, every human being comes into existence with a determinate amount of constitutional stamina—an unreplenishable fund of life. (§ 887.) This fund cannot, by any possible earthly means, be made to meet the necessary expenditures of vital action, beyond a certain period:—but it can be profligately squandered in one fourth, or one tenth part of the time which it might be made to last:—2d, all vital action is necessarily attended with some expenditure of vital power and waste of organized substance, (§ 376.)

—draws something from the ultimate and unreplenishable fund of life—and therefore, all excessive vital action—all *intensity* of vital action, (§ 1109.) increases the expenditure of vital power, and necessarily abbreviates the duration of life:—and consequently, however long the vital economy of any human body, may be able to preserve the general balance of action between the composing and decomposing organs, and maintain the general health of the system, under excessive alimentation, yet nothing is more certain than that just in proportion as the alimentation has exceeded the real, healthy wants of the vital economy, and thus caused an unnecessary expenditure of vital power in the composition and decomposition of that excessive matter, life has been abbreviated;—even though the individual die in what is called old age, without a single violent symptom of disease.—The error of opinion on this subject is so general and so mischievous, that I feel anxious to present the truth in the strongest possible light.

§ 1483. But we have as yet, only contemplated the subject in its most favorable view. The case I have presented is a very extraordinary one. It is truly wonderful with what power, and how long the vital economy of a vigorous and well organized body, will sustain and resist the habitual depredations it is made to endure from the voluntary errors of man!—but it is an extremely rare case, that there is such a balance of power between the several organs, and such a general vigor of the system, as will enable the human body, in any circumstances, to maintain health under excessive alimentation till the constitution is prematurely worn out, and death results from the exhaustion of the vital powers, in what we call old age. For it is a necessary law of living bodies that, always in proportion to the excess of vital action, is the

danger of disease; and therefore, even the best constituted and most vigorous bodies, not only hasten the expenditure of the vital powers of the constitution, by excessive alimentation, and thus tend to an untimely exhaustion of the fund of life; but always, of necessity, proportionately increase the danger of disease and of breaking down and destroying the constitution by violence, even long before its natural energies are exhausted. Hence, millions of human beings perish by disease, in all periods of life, from excessive alimentation and other causes, where one man is enabled to maintain health, under the action of such causes, till he dies from the exhaustion of his vital powers.

§ 1484. Moreover, it is a very important consideration that, in the present state of things, few human beings come into existence with all their organs equally well developed, and free from predispositions of every kind. On the contrary, there is, in almost every individual, some inequality of development and physiological power in the organs of his system—some hereditary taint—some unhappy predisposition to disease. In all such cases, of necessity, the aggregate power of the vital economy as a whole, to bear up under habitual oppressions and depredations, corresponds, not with the vigor of the strongest organ, but with the physiological ability of the weakest organ in the system. Thus, if an individual has a very vigorous stomach and very weak lungs, the power of his vital economy as a whole, to maintain health under excessive alimentation, is not equal to an average of the physiological ability of his stomach, but to an average of that of his lungs; and if he goes beyond this he will inevitably break down and destroy his lungs—and thus his life. (§ 521.) Hence, it is a general physiological law of the human body, that the power of

the vital economy, to maintain health under excessive alimentation, and all other excesses and causes that act on the system in the same general manner, always corresponds with the physiological ability of the weakest organ in the system. (§ 1105.)

§ 1485. Excessive alimentation then, always and inevitably shortens life and tends to produce disease.—If the general organization and constitutional power of the system and the voluntary habits of the individual are such as to enable the vital economy to keep up the general balance of action and maintain health under habitually excessive alimentation, so that no distressing symptoms are experienced, still, as we have seen, (§ 1482.) it is always and necessarily true, that the vital powers of the constitution are expended with a rapidity proportionate to the excess, and life is correspondingly abbreviated. (§ 887.) But this, we have seen, (§ 1483.) cannot take place without commensurately increasing the liability to disease.—Excessive alimentation causes an over-working of all the organs concerned in the general function of nutrition, as well as those employed in the general function of decomposition and elimination, and consequently every organ concerned in the general economy of organic life, is over-taxed, and kept, as it were, in a state of preternatural action.—The whole vascular system—including all the blood-vessels (§ 313.) and lymphatics, (§ 385.) is over-distended, and made to perform excessive labor.

§ 1486. If all the organs of the body are equally well developed, and well balanced in physiological power, which is extremely rare, (§ 1484.) the system will hold on in health, with wonderful energy, till some other cause supervenes to break down some particular organ, or produce morbid action in some particular part.—A sudden exposure to cold, when the vessels of the lungs are all over-

distended, may cause such a reduction of the power of those vessels as will render them unable to press on their contents, and engorgement will ensue;—this will cause a rallying of the vital forces to relieve the parts:—increased action and temperature will take place, and there will be extreme danger of inflammation, change of structure, and fatal pulmonary consumption.—Or perhaps, instead of the lungs, the pleura (§ 176.) or pericardium (§ 368.) or liver or some other internal organ may become the seat of disease.—And instead of exposure to cold, some excess in voluntary action,—some violent effort,—excessive labor, &c. may affect some particular part more than the rest of the body, and thus, determine the locality and character of the disease.—Or, excessive mental action,—anxiety, despondency, grief, anger, fear, or some other passion, may be sufficient in such an overtaxed state of the system, to induce local or general disease. But if no adventitious cause comes in to induce sudden and violent disease, either local or general, the continual over-working of the system will almost inevitably exhaust, debilitate and relax some particular organ or apparatus of organs, so as to destroy the balance of action in the vital economy, and thus gradually lead to chronic and perhaps acute disease.—The vessels of the brain may become relaxed and enlarged, and this may result in apoplexy or dropsy of the brain:—or by the same means, pulmonary apoplexy may take place;—or the kidneys, liver, or some other gland may break down; —or a general debility and atony of the decomposing and eliminating organs may result, and the vital economy, finding itself unable to keep up the balance of action in the system, by healthfully disposing of the excessive aliment as fast as it is received, may resort to the last temporary expedient in its power, for the present preservation

of life and health, and deposite its excessive matter in a partially assimilated state, in the loose cellular tissue, in the manner we have already contemplated (§ 508.—511.) —and thus, as it were, create a great swamp or morass, of crude, fatty and watery matter, for the common drainage and common safety of the vital domain.

§ 1487. This diseased action may lead to general corpulence and obesity, and keep up the functional power and activity of the digestive organs, at the continual and imminent risk of sudden death from congestion or apoplexy in the brain or some other important organ;—or it may result in local or general dropsy and thus terminate life.—Or, if the decomposing and eliminating organs hold out, and keep pace in function with the excesses of alimentation, the digestive, or some other of the assimilating organs, will sooner or later, almost certainly break down, and thus, chronic or acute disease of the most distressing kind will be induced.

§ 1488. But when, as is almost universally the case in the present state of the human race, (§ 1484.) the organs are not equally developed and powerful, but the brain, stomach, lungs, liver, kidneys, or some other organ or part of the system is constitutionally weak and predisposed to disease, then, unless the particular circumstances and habits of the individual are such as to cause a special morbid determination to some other part, habitually excessive alimentation will inevitably, sooner or later, break down the organ or part which is naturally the most feeble, and develop its predisposition into active disease: and when any organ is thus broken down and brought into a morbid condition, the standard of excess in regard to alimentation is altered.—Instead of being more than the general vigor of the healthy system requires, it is now, more than the diseased organ can bear. (§ 1105.)

For, when disease is once established in such an organ, by such a cause, so long as the alimentary matter received into the digestive organs, is more than the good of the diseased organ requires, that organ will be kept in a diseased state by excessive alimentation, unless, indeed, a more active disease should be induced in some other organ. Thus, by excessive alimentation, chronic disease, and often of the most distressing kind, is produced and kept up for years, in the brain, eyes, ears, nose, mouth, throat, lungs, stomach, intestines, liver, kidneys, skin, nerves, muscles, bones, or some other organ or part, and, perhaps finally terminates in premature death; and all the time, the deluded sufferer is resorting to every conceivable remedy but the true one, and dosing himself with every species of drugs and medicines, that human science and ingenuity can devise, and that empiricism can employ: and as continually cherishing his disease, and perpetuating his sufferings by excessive alimentation, or by over-eating. (§ 521.)

§ 1489. It is therefore, beyond all question, true that in all countries where human aliment is abundant, and easily procured, gluttony or excessive alimentation, is decidedly the greatest source of disease and suffering and premature death, to man!—"Excess in *drinking*," said Hippocrates, more than two thousand years ago, "is almost as bad as excess in *eating*,"—and the statement has remained true from that day to the present.—Nay! from the first transgression in Eden to this hour!—Intoxicating liquors and substances, with all their fearful energy to destroy, and all the tremendous evils they have done,—and surely, they are great!—terribly great!—have still caused less disease and pain and untimely death, in the human family, than errors in the *quantity* and *quality* of

food!—A drunkard sometimes, though very rarely, reaches old age:—a glutton never does! (§ 1326.)

§ 1490. If man were in all respects, as strictly obedient to the physiological laws of his nature as other animals in a truly natural state, he would be no more gluttonously inclined; but would be safely guided and governed by his instincts in regard to kinds and quantities of food. (§ 1427) But, physiologically depraved as man universally is, if he leaves himself to the guidance and control of appetite (§ 1432) he will almost inevitably run into excess:—and hence, the universal fact, that where man has the means of alimentary indulgence, he habitually takes more food than is consistent with the highest physiological and psychological interests of his nature—more than is compatible with the greatest vigor and sprightliness and longevity of body, or with the greatest serenity and happiness of mind, or with the greatest degree of intellectual activity and power, or the most exalted moral purity and goodness.

§ 1491. In the present state of the world, a large portion of the human family are restrained by necessity from habitual gluttony:—yet the most ill-fed inhabitant of Europe or of Asia, needs but the means and opportunity, to prove that he is, in this respect, a human being. In our country therefore, where there is an almost unlimited abundance of human aliment, and where every one of correct habits, can be bountifully supplied, nothing but self-restraint can keep the people from gluttonous excess. But hitherto they have not been sufficiently aware of the importance of such self-restraint, and consequently, they have run to great excess.—The people of the United States, as a body, probably eat twice as much food as is consistent with the highest well-being of their nature:—and it is probably true, as I have before observed,

(§ 805.) that the people of New England, as a general fact, are habitually more gluttonous than any other portion of the human family; because they have the means, the opportunities and the greatest temptations to be so.

§ 1492. Still, the evil itself is not greater, than the difficulty of regulating the dietetic habits of man in regard to the quantity of his food.—In the first place, it is impossible to ascertain the precise quantity which man, in all the diversities of human circumstances and conditions, requires: and in the second place, it is almost equally impossible to induce him to govern himself by any well ascertained principles in relation to this point, with sufficient integrity, to be habitually temperate in the quantity of his food.

§ 1493. Some writers on diet, have laid down precise rules, and given the exact weight and measure by which man should govern himself in regard to quantity. But this I shall not attempt to do. I can only say, as I have said, that the universal and powerful propensity of man is always to excess:—and more especially in civic life, where artificial preparations of food serve both to create and to provoke a morbid appetite (§ 1417.)—and that excessive alimentation, or over-eating, is beyond all question, decidedly the greatest source of disease and suffering and untimely death to man, in every portion of the world, where the alimentary supplies are abundant. (§ 1489.)—And hence, it is of the utmost importance for every one to guard continually and rigorously against this propensity.—However correct the *quality* of our food may be, if we habitually over-eat, our whole nature is injured, and always in proportion to our excess.—Indeed, it is, as a general rule, strictly true, that *a correct quantity of a less wholesome aliment, is better for man, than an excessively small, or an excessively large quantity of a*

more wholesome aliment.—So far as health and longevity are considered, therefore, it is incomparably better for man to subsist on a *correct quantity* of vegetable and animal food, properly prepared, than habitually to indulge in an excessive quantity of pure vegetable food of the best kind, and prepared in the best manner: and the difference is still greater if the vegetable food is viciously prepared.—And it is solely from the want of a proper regard to this important truth, that many have been unsuccessful in their experiment, who have attempted to live exclusively on vegetable food.

§ 1494. In fact, the propensity to over-eat, is far the most incorrigible evil with which we have to grapple in attempting to reform the dietetic habits of the human race. Because it is so difficult, in the first place, to convince mankind of the importance of it; and because it is yet more difficult, in the second place, for man when fully convinced, to govern himself according to his own convictions, while surrounded by continual temptations and impelled by a treacherous appetite. But it is in vain!—utterly in vain to hope for any considerable improvement in the condition of man, unless some means can be adopted by which he can be induced, as a free moral agent, habitually to restrain himself from excessive alimentation. (§ 1326.)

Quantity of Food.

§ 1495. It is however, impossible to state any particular *quantity* of food, which would be best for every one, of every age and situation and condition. The active, vigorous, laboring man of middle age, requires more food than a child or an old man, and more than a sedentary, or studious, or feeble man of the same age; and the same individual requires more food under some

circumstances, than under others. As a general rule, the quantity of our food should—within certain limits, be proportionate to the amount of our active exercise;—(§ 1449.) yet the most athletic and active, laboring man, is, in our country, constantly in danger of taking too much food. Indeed, it is unquestionably true, that at least, ninety-nine of the farmers and other laboring men of New England, are prematurely worn out and broken down by over-eating, where one is thus affected by excessive labor, or hard work: (§ 805.)—A very small quantity of good farinaceous food, is sufficient to supply the alimentary wants of the vital economy, even of the most robust body of an active laborer; and all that exceeds the proper supply of those wants, necessarily oppresses the organs, diminishes the muscular power, and serves to impair and wear out and break down all the energies of the system.—The laboring class however, probably suffer less than the other portions of society, from excessive alimentation.

§ 1496. The only general rule I can give, in regard to the quantity of food proper for man, therefore, is this:—let every one consider that excessive alimentation is one of the greatest sources of evil to the human family in civic life: (§ 1489.)—and that every member of society has a continual and powerful tendency to this excess: (§ 1490.) and therefore, that, **EVERY INDIVIDUAL SHOULD, AS A GENERAL RULE, RESTRAIN HIMSELF TO THE SMALLEST QUANTITY, WHICH HE FINDS FROM CAREFUL INVESTIGATION AND ENLIGHTENED EXPERIENCE AND OBSERVATION, WILL FULLY MEET THE ALIMENTARY WANTS OF THE VITAL ECONOMY OF HIS SYSTEM,—KNOWING THAT WHATSOEVER IS MORE THAN THIS IS EVIL!**—And let every one remember also, that, as a general rule, in civic life, *there cannot be*

a blinder guide, in regard to quantity of food, than appetite: and he that follows it, will surely be led into excess!—*for the most athletic and active laborer can not habitually eat artificially prepared food, even of the simplest and plainest kind, till his appetite is perfectly satisfied, without sooner or later experiencing serious evils from excessive alimentation:* and if this is true of the robust, active laborer, to a much greater extent it is true of the inactive, and sedentary and studious and feeble.

§ 1497. It is a humiliating truth, that much the greatest, and indeed, almost the only real difficulty experienced by those who, after having grown up in the glutinous habits of society, and perhaps destroyed their health mainly by over-eating, as a last resort, adopt the mode of living inculcated in my lectures, is that of resisting the propensity to eat more than is compatible with the welfare of their nature. (§ 1494.)—The sense of taste being greatly redeemed from its depravity (§ 711.) and restored to much of its natural purity and delicate susceptibility, (§ 708.) and the food being simple and such as is best adapted, not only to supply the alimentary wants of the body, (§ 768.) but also to afford the highest gustatory enjoyment, (§ 713.) they relish it so well, and enjoy it so much, that it requires the most perfect self-control to be able, at all times, to refrain from overstepping the bounds of temperance in quantity: and hence, it is the most insurmountable obstacle in the way of the practical success of the dietetic principles which I teach: and especially, in their application to adults, or those whose habits have been established in the ordinary mode of living.—Thus far in the great experiment, it is certain that excessive alimentation, or over-eating, has been the grand cause of failure with a large majority

of those who have been unsuccessful adventurers in the dietetic system which I advocate.

§ 1498. I say again therefore, (§ 1496.) that it is not possible for me to lay down a more perfect general rule, for all persons, in all circumstances and conditions, than that, *every individual should restrain himself to the smallest quantity of food, which he finds from careful investigation and enlightened experience and observation, will fully meet the alimentary wants of the vital economy of his system*:—and in ascertaining this point, he is not to be governed by his *feelings* during a few of the first days, or even weeks of his experiment: nor yet by the testimony of the scales or steelyards: for it will often happen that a regimen under which an individual will feel very uncomfortable for a while at first, and lose several pounds in weight, will in the end, after his system has become accustomed to it, not only remove all of his uncomfortable feelings, and restore his former weight, but in every respect, greatly improve his health and strength, and the condition of all his faculties.

§ 1499. In some cases of disease, it will often be found necessary for the invalid to limit himself to the smallest quantity of food that will prevent actual starvation.—“The more you nourish a diseased body,” said Hippocrates, “the worse you make it;” and this, in almost every instance is strictly true. Yet when such a retrenchment is first commenced, the patient will often feel exceedingly uncomfortable; and perhaps imagine that all his symptoms are really becoming more violent and dangerous. But such things should by no means discourage him, if he is following the advice of a truly enlightened physician.

§ 1500. If at any time however, an individual in any condition and circumstances, finds that he has indulged to excess in the quantity of his food, let him take warn-

ing from the first indications, and immediately retrench;— or if he has already gone so far as to have brought on unpleasant symptoms of indigestion or other difficulties, (§ 1462.) such as acidity of the stomach, eructations, headache, or pain in any other part, or a general languor and disquietude, let him lose a meal, or even fast a day, and always after such a fast return to his usual meals with great caution, eating very lightly for a day or two, and in this manner, with proper exercise, he will throw off every unpleasant symptom, and prevent disease.— Acidity of stomach may always be completely relieved in this way: and so may almost every other disagreeable and painful feeling and disorder, if taken in proper time.

Quantity of Food proper for Children.

§ 1501. Children, in civic life, even when their diet is of the simplest and plainest kind, are always strongly inclined to take more food than is good for them; and when they are allowed to indulge in all the variety of culinary preparations, they are sure to run into great excess; and thus either cut themselves off in very early life, or lay the foundations for distressing chronic disease in future years.— While their bodies are growing, it is true that they require more aliment than they otherwise would: (§ 1478.) still however, they are in constant danger of excess, and therefore continual restraint is necessary; for, as I have already stated, (§ 1463.) though convulsions or other distressing symptoms may not immediately follow every instance of dietetic error, yet the effects of these errors are none the less certain; and though judgment is not visited immediately upon the transgressor, it will inevitably come, sooner or later.

§ 1502. While children nurse, (§ 1468.) they should,

as a general rule, be confined, at least, till near the time they are weaned, to the natural food which the mother or nurse affords. And if from any cause, other food be found necessary before that time, the very best substitute for the mother's nourishment is thus prepared. Take some good wheat and wash it clean and dry it; and let it be finely ground without bolting; then, with about a table spoonful of this meal and a pint of pure water, make a thin gruel, which should be boiled about fifteen minutes, and then about a pint of good new milk fresh from the cow should be added:—and this milk should if possible be always from the same young, healthy cow, which is kept on good hay or grass. (§ 1306.) The food thus prepared, and taken in moderate quantities, after the child is three months old, will have the happiest effect on its little body, and may be continued till it is old enough to take regular meals of solid aliment. Pap made of superfine flour, sago, arrowroot, &c. is decidedly less wholesome.

§ 1503. When children are weaned, (§ 1304.) good coarse wheaten bread and a portion of good new milk, diluted with about half as much boiling water, or pure soft water, together with a proper supply of good ripe fruit in its season, should mainly constitute their diet. Rice, Indian corn, rye, peas, beans, potatoes and other vegetables, plainly and simply prepared, so as to secure, as far as possible, full mastication, may also, be allowed them as their years increase;—but every judicious measure should be taken to cause them, with the least possible appearance of authoritative restraint, to limit themselves to such a quantity of food at each meal, as is compatible with the permanent welfare of their whole nature. Every thing stimulating and heating, both in their food and drink, should be carefully avoided. Children should on

no account, except from necessity, to avoid actual starvation, be allowed to taste of flesh; (§ 1263.) and still more carefully should they be guarded against alcoholic and narcotic stimulants of every kind.—Their only drink should be water,—and that, as far as possible, should always be pure and perfectly soft.—They will however, require very little drink, if all their dietetic habits are correct.

§ 1504. If these, and other directions which I have given and shall give concerning children, are properly observed, parents will never have reason to complain of the evil effects of an exclusively vegetable diet; (§ 1264.) —nor have occasion to resort to the unnatural and monstrous practice of feeding their children with flesh and wine, and other stimulating and poisonous substances, in order to "*invigorate their systems.*" And it is most certain that, parents cannot well be too careful about the dietetic habits of their children. Their prosperity and happiness during their whole existence, here and hereafter, are intimately connected with these things: and the christian mother who makes the table a snare to her offspring, is in reality, far more cruel, than the benighted heathen mother, who buries her children alive, and with her own feet, treads down the smothering earth upon them in their graves.

§ 1505. Parents! if you truly desire that your children should live and be permanently healthy and useful and happy in life, and blessed for ever, see that their food be of a proper quality, and plainly and simply prepared; and that they be regular in their times of eating, and eat no more than the healthy nourishment and growth of their bodies require:—and in regulating these points, always keep in view their age and circumstances—their habits of active exercise—of study—confinement, &c. &c. (§ 1471.)

Quantity of Food proper for Aged People.

§ 1506. I have said (§ 1473.) that, in the best ordered life, the physiological powers of the body, gradually decline as old age advances: and that the functional energies of the digestive organs, and the alimentary wants of the vital economy, suffer a correspondent diminution. Consequently, man requires less food in old age, than in the meridian of life; and it is more immediately essential to his health and comfort that his food should be plain and simple and unstimulating. Nothing can be more false than the abominable proverb, that "*wine is the old man's milk.*" It is always the bane of every man that drinks it; and the old man has less vital power to resist and repair its deleterious effects, than one in the vigor of meridian days,—hence, if a man has used it ever so long, when he begins to approach old age, if he would prolong his life in health and serenity, and the possession of all his faculties, and have his last days his best days, he must entirely abandon every intoxicating drink and substance, and, with great regularity in regard to times of eating, confine himself wholly to a plain, simple vegetable diet; gradually diminishing his quantity of food as the physiological powers of his body slowly decline. He who regularly and wisely pursues such a course, will never sink into that miserable dotation, in which the soul, with all its faculties, seems to become extinct, or completely sepulchred in the living body; and in which, even the animal instincts are so nearly obliterated, that they are no longer capable of discharging their duties to the domain of organic life; but the surviving carcass, like a monster born without a brain, is left to the care of impatient and loathing offspring, or the hireling and heartless attention and service of others:—but his will be "*a*

green old age"—healthful and serene and intelligent and cheerful, and capable of natural and intellectual and moral enjoyment to the last. (§ 688.) And when his constitutional fund of life is expended, he will calmly expire, without an agony or struggle, like one who falls asleep in the sweet tranquillity of his soul.

§ 1507. O ye, whose pious hearts are ardent in your love for your aged parents,—who feel it one of the most grateful privileges of your lives, that you may be permitted to return to them something of the attention and kindness you have received from them, and who fervently desire that they may long continue to enjoy your dutifulness and to bless your board and household by their patriarchal presence and influence and ripened council, I solemnly charge you not to destroy them and afflict yourselves, by a luxurious table:—but spare no pains to provide for them a plain and simple diet of the very best and most wholesome quality, and to secure the greatest regularity to all their habits;—and be assured you will not lose your reward.

§ 1508. On the whole then, the food of man should always be plain and simple, and all the artificial preparations should be made as consistent as possible with the laws of constitution and relation established in his nature; or with his organization and physiological properties and powers. (§ 1320. *et seq.*)

§ 1509. The quantity of his aliment should never exceed the real wants of his vital economy, and his meals should always be taken at regular and stated periods,—and when at any time he perceives the symptoms of excessive alimentation, he should either immediately retrench in quantity, or omit a meal, or fast a day, and then return with great moderation to his regular meals.

§ 1510. He should always be careful to masticate or

chew his food very fully, and completely reduce it to fine particles in his mouth and mix it freely with the salivary fluid, before he swallows it: for all masses of unchewed food in the stomach, very slowly digest, and always tend to worry and irritate that organ and disturb its function; and in many instances they produce very serious effects both on the physiological and psychological powers. Cramps, colics, convulsions, delirium, &c., have frequently resulted from such causes. (§ 436.)

§ 1511. The meal ought never to be made in a hurry: but the food should be slowly swallowed: (§ 1320. Note) —for if it is too rapidly introduced into the stomach it always oppresses and irritates that organ,—impairs its functional power, and serves to bring on dyspepsy and innumerable other evils. (§ 727.) Hence, the table should always be made the scene of social enjoyment and cheerfulness. Interesting conversation and pleasantry and wit are peculiarly appropriate to the hour of eating; that every individual may feel that mere sensual gratification, is not the only nor the highest enjoyment of the table; and that by such means, the food may be more slowly introduced into the stomach; and consequently, a less quantity eaten. “If you would live long and enjoy life,” said Lord Bacon “be cheerful at your meals and on going to bed.” This is an admirable precept.

§ 1512. In conclusion of my dietetic remarks, it is important that I should repeat that, as a general rule, no one in health, should make great dietetic changes very suddenly. In some cases of disease, extremes are sometimes necessary, and the physician may be obliged to cut a man off at once, from a full diet, and put him on an extremely abstemious regimen. But ordinarily, dietetic changes should take place more gradually:—not that there is really so much danger in chang-

ing suddenly, from a worse to a better diet, as is generally supposed;—but that the uncomfortable feelings which at first attend such sudden changes, are such as are almost certain to drive most people back to their old habits. And therefore, as Moses, under the direction of the Lord, did not attempt to lead the Jews by the shortest way from Egypt to the promised land, lest the difficulties of that way should induce them to return to Egypt, so I for the same reasons, advise those who are disposed to conform to the principles which I have advanced, not to act precipitately and with more zeal than judgment: but carefully to examine the way before them, and proceed intelligently and wisely. And let none expect to find himself in an elysium in a few days, or weeks or months, after he enters upon his experiment. The effects of the course which I point out, are not like those of the way which embraces an abundance of intoxicating substances, and other means of sensual excitement and indulgence.— However wholesome a pure vegetable diet may be, it causes no paroxysms of rapturous excitement:—however delicious a draught of pure water may be to an undravaged palate, it produces no transports of delirious ecstasy. But the real encouragements of the course which I recommend, are, in general terms, exemption from disease and pain,—permanent and uniform health, and temperate enjoyment of body,—a serene and contented and cheerful mind,—and clear and active intellectual and moral powers: and it promises not only to afford us these blessings in the early part and the meridian of life, but to continue them to us unimpaired, at that period of our existence, when, in the ordinary habits of life, mankind experience the rapid decline of all their powers, and the accumulation of those infirmities of age, which render longevity hardly desirable, (§ 691.) and it promises to

sustain us in the enjoyment of these blessings, without any change in their quality, and with but little abatement in their degree, (§ 688.) almost to the last pulse of a protracted life,—and thus in the most eminent manner, fit us for the greatest usefulness in the present state of being, and, as the mightiest auxiliary to the true religion of the soul, qualify us for the greatest enjoyment in our future existence:—and finally, it promises to compose our bodies at last, in the dreamless sleep of death, without a struggle—without a pain. No one therefore, ought to consider that he has made even a fair beginning of this great experiment, in less than one year's time of honest conformity to the principles which I teach; and five years of such conformity is the shortest time that can be considered a fair trial of the system.—I say to all then, act rationally and wisely!—Honestly and diligently seek after truth, and cordially embrace and obey it when you find it:—and be assured that “WISDOM'S WAYS ARE WAYS OF PLEASANTNESS, AND ALL HER PATHS ARE PEACE!”

The natural Drink of Man.

§ 1513. We have seen that the human body is composed of solids and fluids; (§ 124.) that the blood, from which all the other substances of the body are formed, (§ 118.) consists of innumerable animal molecules, or globules of animalized matter, and an aqueous menstruum, called the serum. (§ 492.) The serum, in a perfectly healthy state of the system, consists almost entirely of water. The saline and other properties found in it, vary so considerably with the varying habits of the individual and conditions of the system, that it is impossible in the present state of things, to determine with any certainty, how

far they are truly normal and how far they are adventitious. We have seen also, that water, and the aqueous juices of fruits, when received into the stomach, are absorbed by the radicles of the portal system (§ 450. 452.) and mingled with the blood of that system, and finally pass into the general circulation, and become the serum of the blood, without undergoing any assimilating change.— From the serum of the blood, are produced all the serous exhalations by which the internal parts are continually moistened, and the aqueous portions of all the secretions of the system; (§ 507.) and also, the exhalations of the lungs and skin; and nearly, if not entirely, the secretion or excretion of the kidneys. (§ 458. 460.)—Furthermore, it is a well ascertained physiological truth, that if perfectly pure water, of a proper temperature, be brought in direct contact with the most delicate and highly susceptible living tissue of the body, no disturbance is produced,—no physiological excitement or vital reaction takes place.—This completely demonstrates the perfect adaptation of pure water, to the vital properties of all the tissues of the body, (§ 312.) and shows not only, that, under the healthy regulations of the vital economy, it may be diffused over the whole system, and penetrate even the most delicate medullary (§ 162.) and other substances, with perfect safety, but that it is as necessary to the organic functions and effects of the system as the alimentary matter from which the animalized corpuscles of the blood are formed.*

§ 1514. There is no evidence that water ever undergoes any assimilating change in the system, or is in any measure appropriated to the formation of the animal solids.—In people of corpulent habits, where there is a

* The blood, by chemical decomposition, affords about ninety per cent. of water, and the brain nearly an equal proportion.

strong predisposition to the accumulation of adipose matter in the loose cellular tissue, (§ 508.) if large quantities of water be habitually drunk, it will sometimes, lead to a species of dropsy in the adipose tissue, and thus considerably increase the bulk and weight of the body. In this manner, people of such habits, sometimes increase their weight from fifteen to thirty pounds during the summer, when they drink water very freely, and lose it again in the winter, when they drink less,—even though they actually consume less aliment in the summer than in the winter. It is true also, that an individual can sustain life considerably longer without food, if he continues to use water, than he can if he abstains both from food and drink; but neither these facts, nor any other yet known, afford any evidence that water is ever assimilated and appropriated to the purposes of nourishment in the system; and therefore, it may be considered as certain, that it enters the vital domain (§ 287.) as an unchanged substance, and serves all the purposes of the vital economy for which it is introduced into the system, and is finally eliminated from the body without undergoing any assimilating change.

§ 1515. The normal purposes therefore, for which water is required in the living animal body, are—1st, to serve as a menstruum to the animalized or assimilated matter of the blood, in order to give it sufficient fluidity to enable the vital economy to effect the general purposes of circulation and nutrition—or, in other words, in order to make it sufficiently thin to pass freely through all the arteries and veins, and all the minute vessels of the system, in which the principal changes take place, (§ 384.) and which are concerned in nourishing the several structures, and forming the several secretions of the body: (§ 374.)—2d, to supply the aqueous portion

of the secretions of the system: (§ 1513.)—3d, to be the source of all the serous exhalations by which the internal organs and parts are continually moistened: (§ 507.) and—4th, to dilute, and as it were, to flood off, in the form of pulmonary exhalation, cutaneous perspiration, renal secretion, &c., the worn-out or decomposed matter of the system, (§ 516.) and whatever foreign and impure substances may be absorbed into the vital domain (§ 494.)—and also, when necessary, to afford a serous excretion to the mucous surface of the alimentary cavity, to dilute and flood away any irritating or disturbing substance that may, by any means, find its way into the stomach or intestines.

§ 1516. It is now a perfectly well ascertained physiological truth, that no other fluid but pure water will answer these purposes of the vital economy.—Every other substance in nature or that can be produced by art, which is either a fluid itself, or capable of being kept in a fluid state by aqueous solution or mixture, if introduced unchanged into the general circulation of the animal body, is more or less a cause of excitement, irritation and disturbance to the living tissues and organs with which it comes in contact, and therefore, always, more or less injurious to the physiological interest of the system.—Hence, as we have seen, (§ 458.) a special economy is established for the protection of the vital domain, as far as possible, from all such foreign and unfriendly substances.—If any digestible matter is received into the stomach, in aqueous solution or mixture, it is retained in the alimentary cavity and digested before it is permitted to pass into the vital domain,—and the water only, is absorbed in its unchanged state;—but, if in the general integrity of the system, indigestible mineral or vegetable substances are received into the stomach in

aqueous solution, they are either rejected by vomiting or evacuated from the alimentary cavity by the bowels; or absorbed into the portal veins unchanged; (§ 450. 452.) and as hastily as possible, sent off to the liver, lungs, kidneys and skin, and eliminated from the body: (§ 460.) and by these means, the water is filtered and purified from all foreign and improper substances before it is permitted to enter the general circulation, and become the menstruum of the living blood. (§ 492.—495.) But when by long-continued, depraving habits, the nice physiological integrity of the system is greatly impaired, these substances are permitted to pass more and more freely into the general circulation, and to pervade every part, and thus the whole system is made to feel their immediate presence and to suffer from their pernicious properties. (§ 453. 458.)

§ 1517. With the most precise and determinate relation to this specific physiological want then, the special sense of thirst (§ 605. 767.) is established in the organic economy:—and in the perfect health and integrity of the system, its demand is always specific and determinate.—It asks for pure water; and only for pure water:—and no other production of nature nor of art can healthfully answer its demands.—Whatever be the beverage used by man therefore, when true, healthy thirst is experienced, it is only the purely aqueous portion of the beverage, that satisfies the want and answers the physiological purposes of the vital economy.

§ 1518. The sense of thirst is instinctively referred to the fauces or the throat, but careful and accurate experiment has proved that if water be introduced into the stomach without being swallowed, (§ 431. Note) thirst is fully satisfied. From this, and many other corroborating facts in relation to this point, it is very certain that thirst, like

hunger, (§ 1425.) consists in the animal perception of a certain physiological condition of the stomach; (§ 1426.) and in this condition, the stomach is prepared to receive water and absorb it with much greater ease and rapidity than at any other time.

§ 1519. If water were only employed as a menstruum to the animalized matter of the blood, (§ 493.) its waste would be exceedingly small, and the vital economy would rarely require a fresh supply: and as that portion of the serum which is exhaled for the moistening of the internal organs and parts, is continually re-absorbed by appropriate vessels (§ 451.) and returned to the circulation, even this employment of the water received into the vital domain, would cause but a very slow expenditure, and but seldom require a replenishment.—It is therefore, almost exclusively the employment of the serum, to dilute and flood away the effete matter and impurities of blood, (§ 471.) in the vapor of the lungs, the perspiration of the skin, and secretions of the kidneys, liver, &c. (§ 516.) that causes the continual waste of the aqueous portion of the fluids of the system, and renders a frequent replenishment necessary.

§ 1520. In a perfectly normal, healthy, and undepraved state of the system therefore, thirst is a true instinctive demand of the vital economy for a supply of pure water, (§ 1517.) and when such a demand is made, a draught of pure water, is always exceedingly grateful and highly salutary. But the special sense of thirst like that of hunger, (§ 1433.) may be so excessively depraved, and its integrity so entirely destroyed, that its demands may be wholly at variance with the real wants of the vital domain, and it may be irresistibly importunate for drink at a time when the vital economy would be injured by the introduction of any fluid into the stomach; and it may also be

vehement and despotic in its demands for both quantities and qualities of drink, which would be extremely detrimental to the system.

§ 1521. If the dietetic and all other habits and circumstances of man, were truly natural and in strict accordance with the laws of his nature, he would very seldom require drink, and therefore, very rarely experience thirst.—The fruits and succulent vegetables which entered into his diet, would afford all the aqueous matter that his vital economy requires; and this would always be of the purest and most salutary kind. Besides, being introduced in such a form, the stomach would never be inundated by a flood of water at once, but would receive it more gradually, and in a manner better adapted to the action of its absorbent and receiving vessels. (§ 452.) So that, by this means, the system would be secured from improper quantities and qualities of fluid, and the sense of thirst would never be depraved, nor its integrity impaired. Many individuals in the United States, who have adopted the diet and general regimen advocated in these lectures, have so regulated their dietetic habits, as to be able to live without taking any kind of drink or feeling thirst, for the space of three, four, and six months; and these have invariably found that their health was, in every respect, more perfect at such times, than when they frequently experienced thirst, and drank even pure water.—By deviations from the strict line of physiological rectitude however, in the quantity and quality of food and drink, and other errors of voluntary habits, the actual demand of the vital economy for pure water is increased, and the integrity of thirst as a natural instinct is always more or less impaired.

§ 1522. We have seen (§ 376.) that all vital action is attended with an expenditure of vital power and waste of

organized substance, and (§ 697.) that every organ in the system, in the performance of its particular function in the general economy, necessarily to some extent, exhausts its vital powers and wastes its substance: and therefore, it is always and necessarily true, that in proportion as any one organ is over-tasked or made to do more than is requisite for the health and integrity of the system in its perfectly normal state, (§ 1070.) the organ itself is injured and the whole system suffers; (§ 297. 298.)—and hence, as in regard to excessive alimentation, (§ 1481.) so in regard to excessive imbibition, or drinking, when a larger quantity of fluid is received into the stomach than is demanded by the immediate wants of the vital economy, it must be disposed of in some way or other.—The absorbents (§ 452.) are made to perform unnecessary labor in taking it up, and then, it cannot be permitted to enter into the general circulation and remain there; but must, as speedily as possible, be expelled from the vital domain: and therefore, all the organs employed in the performance of this work, (§ 516.) are also made to do unnecessary duty:—and when excesses of this kind are habitual, both the organs employed in receiving the fluid into, and those employed in expelling it from the vital domain, are over-tasked, debilitated and relaxed; and often brought into a morbid condition; and not unfrequently involve the whole system in fatal disease, attended perhaps, with a morbid and most distressing thirst,—the gratification of which, only increases the evil, and renders the thirst itself more vehement and tormenting.—Thus habitual over-drinking may break down the kidneys and bring on diabetes, or, like excessive alimentation, (§ 1486.) so debilitate, relax and prostrate the absorbing and eliminating organs, as to bring on a general dropsy:—and although neither of

these distressing complaints may result from habitual over-drinking, yet most inevitably, the practice is injurious to the system, and always in proportion to the excess in the quantity and error in the quality of the liquids drunk.

§ 1523. The principal physiological cause of the necessity for a constant supply of aqueous matter to the vital domain, in a truly healthy and proper state of the system, we have seen, (§ 1519.) is the expenditure of the serum of the blood, in the vapor of the lungs, the perspiration of the skin, and the secretion of the kidneys; and this, we have seen, (§ 1521.) if man's habits and circumstances were in all respects correct, would require no greater supply than would be afforded in the juices of the fruits and succulent vegetables that entered into his diet; and consequently, in such a case, man would very rarely experience thirst;—indeed, never, unless the healthy action of his system was in some measure disturbed. But the voluntary habits and circumstances of man are so continually infringing the physiological laws of his nature, that the vital operations of his organic economy, are almost incessantly disturbed, and the integrity of all his physiological powers and instincts, more or less impaired.

§ 1524. The quantity of water exhaled from the lungs, (§ 479.) varies with circumstances, but it is much more uniform than that which passes off through the skin and kidneys. (§ 517.) Yet even the cutaneous perspiration and renal secretion would vary much less than they usually do, if the voluntary habits and circumstances of man were always in conformity to the constitutional laws of his nature. As a general rule however, the copiousness of the cutaneous perspiration corresponds with the degree of muscular exercise. If the latter is unusually energetic and continued, the former often becomes so free,

that it passes from the insensible, to the sensible form, and, instead of escaping from the body in a state of vapor, it exudes in liquid drops, and sometimes gushes, as it were, from the whole external surface, in a drenching, flood.—This of course, rapidly diminishes the quantity of aqueous matter in the body, and, unless there was a considerable excess of it previously in the system, it will cause such a sudden expenditure of the serum of the blood, as will require a prompt and free replenishment; and consequently, the sense of thirst will be felt with a degree of intensity corresponding with the urgency of the want; and will hardly be satisfied with any thing less than a copious draught of water.—In this manner, laboring people whose dietetic habits are not most favorable to the physiological interests of their bodies, will perspire very profusely,—and especially in hot weather,—and of course, they drink as freely as they perspire: and indeed, it is a common opinion with this class of people, that it is a benefit to them to perspire freely, and that they labor the more easily for it.—But this is a great, and a mischievous error. Every rational being ought to know that it can be of no possible benefit to his vital powers to filter several quarts of water through his body, daily: and laborers who drink much and perspire much, actually do this, to the decided diminution of their strength, and detriment of all their powers:—for they are not, in the least degree, nourishing or sustaining their bodies by their free drinking; but are taking large quantities of aqueous matter into the stomach to be received into the vital domain by the absorbents, and then, as speedily as possible, to be expelled from that domain, by another set of organs; and principally through the skin; and thereby, as we have seen, (§ 1522.) they are compelling both the absorbing and the eliminating organs to do a very great

deal of unnecessary duty, by which they are exhausted, debilitated and relaxed, and perhaps actually and permanently diseased,—even if the drink is always pure water.

§ 1525. Copious perspiration therefore, as a general law, is decidedly debilitating to the body, and where it is habitual or continued it is otherwise detrimental. The strength of the laboring man is always diminished by it, and he is necessarily, more fatigued and exhausted at the close of a day's labor, in consequence of it. If the dietetic and other habits of man were in accordance with the physiological laws of his nature, it would be a very extraordinary thing for him, while in health, to perspire profusely,—and never, except in extraordinary circumstances.—The laboring man, while actively engaged in his customary employment, would have a pleasant moisture upon the skin, and nothing more; and this would rarely cause such a rapid exhaustion of the serum of his blood, as to require a very prompt and copious supply of water, as a drink, and consequently, he would rarely experience thirst,—or seldom more than would be fully satisfied at his meal-times, with the succulent or juicy portions of his food. In such a case, the laboring man would go through the toils of the day with much less fatigue and exhaustion, than he who drinks much, and perspires much. This is no fanciful theorizing:—it is perfectly well ascertained physiological truth, and has been fully demonstrated by hundreds in the United States within the last eight years. Every laborer—and there have been many such—who has so regulated his dietetic habits as to require little or no drink, (§ 1521.) has found that he could perform more labor, with little sensible perspiration, and much less fatigue and exhaustion. Indeed, it is, in almost every instance, a matter of surprise with such individuals, that they can perform so much more

labor in a day, than formerly, and yet find themselves at the close of the day, with so little sense of weariness; and with so great a degree of freshness, elasticity and sprightliness.—Surely then, it is a matter of no small importance to the laboring man, to know how he may, as it were, diminish the friction of labor, and thus husband his strength, and in every respect promote his comfort and prosperity.

§ 1526. When, by any means, a general fever is induced in the system, (§1097.) attended by great thirst, it is an instinctive demand of the vital economy for water, as a medicine, to reduce the temperature of the body, to subdue the excessive action, and, probably also, to flood away whatever morbid impurities may have found their way into the circulation. (§ 496.) Cold water, taken freely into the stomach in such a state of the system, is absorbed with astonishing rapidity, and is very soon diffused over the whole organic domain, and is finally evacuated by the skin, lungs, &c., and thus greatly reduces the febrile temperature and action of the system: and if the water is perfectly pure, it has, in every respect, the most salutary effect.—Indeed, if there be any one thing in nature of which it may more truly be said than of any other, that it is a universal catholicon, it is pure cold water. In such cases therefore, the instinctive demand of the vital economy, should always and freely be gratified. Nay more,—pure cold water should not only be drunk as freely as the thirst requires it, but in most cases of high fever, the free application of water to the whole external surface, till the skin feels cool and moist as in health, is a natural and powerful and safe means of subduing the disease. I am entirely confident—and I speak from no ordinary experience in this matter—that the introduction of cold water into the stomach, and judicious ap-

plication of it to the skin, will in most cases, subdue a high fever, more rapidly, more safely and more certainly, than any other means that can be employed.—I have seen the most wonderful success from such treatment, and in the most extreme and desperate cases, when all other remedial means employed in regular practice, had proved ineffectual. But even pure water can be made the instrument of empiricism, and when injudiciously employed, may do far more harm than good.—Wisdom and skill are always requisite in the use of even the simplest remedial means. (§ 1078.)

§ 1527. When therefore, pure water is required by the healthy body, to serve the purposes of the vital economy as a menstruum of the blood, &c., (§ 1515.) and when it is required by the diseased body as a remedial means, the thirst which demands it, is a truly natural instinct, and should always be obeyed: but if we can so regulate our habits and control our circumstances, as to prevent the occurrence of thirst for either of these purposes, we shall certainly do wisely; and yet far more wisely if we can wholly prevent the thirst which is ordinarily experienced by man, and especially in civilized life, and which induces him habitually to drink all sorts of beverages, and at times when the vital economy neither requires the supply of aqueous matter nor can receive it without injury.

§ 1528. In regard to thirst, as of hunger, the natural regularity and periodicity of the vital actions of the body (§ 1428.) always tend to establish a habitude; so that, if an individual, whose habits are in other respects correct, drinks nothing but pure water, and takes that only at a particular hour, his system will soon establish a physiological habitude corresponding with this practice, and his thirst will regularly recur at the stated hour, whether his

vital economy really requires a supply of water or not, and he will rarely if ever feel thirsty at any other time, unless in other respects, he deviates considerably from his ordinary habits. In this manner, we form the habit of drinking at our meal-times, or at stated hours between our meals, and thus, from mere force of habit, millions of gallons of different kinds of drink, are daily poured down human throats, to drench and debilitate the stomach, and to be filtered through the delicate organs of the living body. (§ 1516. 1522.) Yet, the mere thirst of habit, is by no means the most common and the most urgent thirst which impels human beings to drink, to the injury of their bodies and their whole nature.

§ 1529. It is a general physiological law of the system, that, the more exciting the food, the more frequent and intense will be the thirst; hence, they who eat animal food of any kind, and more especially flesh, (§ 919.) are always—in proportion to the freedom with which they use it—more thirsty and drink more, than they who subsist on vegetable food; other things being equal. Again, whatever produces irritation in the alimentary canal, or, by any means, causes a preternatural heat in the mucous membrane of that canal, (§ 338.) will also superinduce thirst, the intensity of which, will always correspond with the degree of irritation and feverish heat. Hence, therefore, however simple our diet, and however correct its quality, if we neglect to masticate our food in a proper manner, (§ 426.) and swallow it too rapidly, it will cause more or less irritation in the stomach, (§ 726.) which will produce an unhealthy degree of heat in that organ and thus occasion thirst:—or if food is taken at an unusual and improper time, when the stomach is not in a condition to receive it, (§ 1436.) more or less of gastric irritation will be caused, and thirst will be an

almost inevitable consequence:—or, if more food is taken at a meal than the stomach can receive and manage with ease, gastric irritation will be caused, producing a feverish degree of heat, and a commensurate intensity of thirst; and if the stomach is somewhat debilitated and is considerably embarrassed in the performance of its function, the thirst thus caused, will be exceedingly urgent and distressing.—If the food is crude and such as is digested with great difficulty, it will almost certainly cause gastric irritation and thirst, and sometimes in a very painful degree. The animal fats or oils always tend to produce gastric irritation and thirst, (§ 1278.) and most especially when mixed with other substances, as in pastry, &c. If salt, pepper, mustard and other purely stimulating substances (§ 743.) are used with the food, gastric excitement and irritation will be produced, corresponding in degree, with the freedom with which those substances are used, and with the potency and deleteriousness of their properties; and a commensurate intensity of thirst will be caused:—and if stimulating and intoxicating drinks are used, thirst will be rendered still more frequent, vehement and irresistible.

§ 1530. The thirst produced by all these causes, is strictly speaking, a morbid thirst, and, as a general fact, is in no measure a true indication that the vital economy really requires a supply of water; on the contrary, this thirst is often most importunate and tormenting, and at times actually irresistible, when drink is not really needed for any of the physiological purposes of the vital economy, and when fluids cannot be received into the stomach without decided and perhaps very great injury to that organ, and through it, to the whole system.—Thus, it not unfrequently happens, and especially in civic life, that when the digestive powers of an individual are

considerably impaired, and he becomes dyspeptic, about an hour after eating, and more usually after dinner, he begins to feel an intensely importunate and distressing thirst. I have seen cases which actually amounted to a species of insanity, and in which the sufferer had no power to resist the morbid craving, but, against the most entire convictions that he ought not to drink, and against the most urgent entreaties and remonstrances of friends and physicians, would rush to a vessel of water if he could get at it, and drink with all the terrible avidity of self-destroying madness. This tormenting thirst is caused by gastric irritation, which is the effect of acidity, and generally also, of the indigestible and irritating substances which he has taken with or for his dinner; and the morbid thirst demands water to dilute and flood away those acrid and irritating substances:—but water or any other liquid received into the stomach at such a time, only serves to convert the contents of that organ, into a mere wash, and thus interrupt the feeble process of digestion, and every way enhance the difficulty and increase the suffering.

§ 1531. But when thirst, by whatever cause produced, is not the true instinctive demand of the vital economy for water, it is never so well satisfied with water as with some stimulating beverage; and when such beverages are used, the sense of thirst is still more depraved; and in exact proportion to the stimulating and intoxicating power of those beverages, and the freedom with which they are used, it becomes more and more exclusively a demand for accustomed stimulus, and correspondently, more frequent and more despotic. So long as the dietetic habits of mankind are greatly at variance with the physiological laws of the human system therefore, nothing but necessity arising from the want of means, or the most

powerful moral restraint, continually imposed and enforced, can keep the race from universal drunkenness:—and hence, the melancholy fact that from the earliest history of the species until now, with the occasional exception of a limited and brief paroxysm of reform, the human world has staggered with inebriation; and, so long as the fixed constitutional laws of nature shall remain, in spite of all the efforts that have been made or that *can be made* to choke man off from his intoxicating cup, the human world will continue to stagger on, unless the reformation goes beyond the cup, and removes the deep depravity of thirst. (§ 778.)

§ 1532. From the argument before us, we perceive that man naturally, seldom requires drink, and that the thirst which most frequently induces him to drink, is not the true demand of the vital economy for water; and that even pure water is decidedly hurtful if taken when not necessary for the physiological purposes of the system, (§ 1515.) or more freely than those purposes require. (§ 1519.) But it were well for man if *excesses in quantity* were the only evil he experiences from the use of water as a drink. With too few exceptions—and especially in civic life—the water employed for this purpose, is charged with those mineral and vegetable and animal impurities which render it exceedingly injurious to the vital organism of the human body.—True, the human species is perpetuated from generation to generation, and society presents what is considered a fair proportion of health and longevity, even in the cities of New York and Boston, where the water is extremely impure; and it is also true, that other portions of the human family, will inhabit regions where the atmosphere is almost continually loaded with the impurities that arise from the decomposition of dead animal and vegetable

matter, and live on from generation to generation, without those evidences of "*experience*" which *compel* them to know, that health is impaired and disease created and life destroyed by the poisonous atmosphere which they breathe. But if *experience* of this kind is to be taken as a proof of the healthfulness of our habits and circumstances, then there is no such thing as a poison in creation, and no region on earth that is not healthy. For, we know that the vital economy of the human body, will so accommodate itself to circumstances, that the deadliest poisons may be habitually taken, and slowly destroy the constitution and cause untimely death, (§ 520.) without producing any symptoms which are so determinate and unequivocal as to compel the sufferer to know that he is injured by those poisons. (§ 960.) Nothing therefore, can well be more erroneous and delusive than this general *experience* of society. But correct physiological science teaches us the indubitable and irrefragable truth that the living tissues of the human body cannot be continually irritated, and the functions of the vital economy habitually disturbed, without impairing health, creating disease and shortening the duration of life.

§ 1533. We have seen (§ 1513.) that when water is introduced into the stomach, it is taken up by the absorbents and received into the portal veins, unchanged, (§ 1516.) and that if it holds in solution any indigestible substances, these are also absorbed with it, and at first, the special economy of the portal system, as far as possible, purifies the water, by a kind of filtration, before it is permitted to enter into the general circulation, and become the serum of the blood. But if water containing such impurities be habitually used, the physiological integrity of the purifying organs becomes impaired and by degrees the impurities are suffered more and more

freely to pass into the general circulation, and to pervade the whole system. (§ 458.) All mineral substances held in aqueous solution, are in this manner absorbed, unchanged, and when the water containing them is habitually used, they become as common in the general circulation as the serum of the blood itself.—And can any rational creature suppose that these substances can be continually passing through the exceedingly minute vessels of the glands, (§ 334.)—of the brain itself, and of every other part of the system, without decidedly injuring the delicate tissues on which they act?—It is well known that if hard water be habitually used for washing the hands, even for a short time, the skin on which it acts, soon loses its natural softness and smoothness and becomes dry and rough, and often cracks and becomes painfully diseased. And can any one believe that a fluid which produces such an effect on the external skin, that is protected by a horny epidermis or cuticle, (§ 287.) can continually come in contact with the most delicate nervous and other tissues of the vital domain, and not injure them!—It is passing strange that a thing so plain as this, should be considered so questionable; and that civilized communities like the citizens of New York and Boston and other places in our country, should either from carelessness or parsimony, continue from year to year and from generation to generation, to harass and lacerate the delicate vessels and tissues of their bodies with the mineral impurities of the water which they drink! Depend upon it, there is no uncertainty in this matter!—The stomach, the liver and every other gland, (§ 333. 334.) and every capillary vessel of the system, (§ 374.)—in short, every organ and tissue and substance of the body, necessarily suffers from the use of such water: and though possibly, no one organ may become the seat of

active disease during life, in consequence of it, yet the functional power of each particular organ is impaired, and the general physiological powers of the system are diminished by it, and every part is rendered more liable to disease, and life is always and inevitably shortened. (§ 887.) Pulmonary consumption, scrofulous affections, indurations, cancers and other diseases of the glands, and diseases of the skin and mucous membrane, are caused by it.—Indeed, it is most true, that functional disturbances and derangements, and structural diseases of every description and of every part, are either increased or aggravated by the use of impure water: and in every kind of chronic ailment, the recovery of health is greatly retarded if not wholly prevented by the use of such water.

§ 1534. The use of water impregnated with mineral substances as a remedial means, or as a medicine, is therefore, in almost every conceivable case, injurious to the human body.—It is true that a solution of common salt, or Glauber or Epsom salt, will, by its powerful irritation, cause such a vital reaction (§ 300. 960.) as to produce a free evacuation of the stomach and bowels, which in certain cases of disease, and for a single time, may, on the whole, be greatly beneficial in the result: yet in every instance, the direct and immediate effect of the mineral on the living tissues of the organs, is detrimental; and if continued, cannot fail to exhaust, debilitate and disease the parts on which it acts.—Thousands of human beings have seriously impaired their digestive organs, and otherwise injured their constitution, by an ill-advised dosing with salts and other mineral substances, under the mistaken notion that by so doing, they were "*purifying their blood.*"—And many thousands have done themselves irreparable injury by the use of the

mineral waters of public watering places.—Universally gluttonous as human beings are where they have the means to be so, (§ 1490.) almost every member of society is more or less troubled with some of the multitudinous ailments which result from habitual over-eating, and of course, if they resort to public watering places, and daily swallow quarts or gallons of water strongly impregnated with mineral substances, it will cause such copious and continued evacuations of the body as will, in most cases, at least temporarily, remove or mitigate the symptoms of repletion: and in some instances, the new disease caused by the mineral water, will, on the principle of counter-irritation, (§ 1072.) subdue the symptoms of chronic disorders, and thus perhaps, remove the morbid affections of the skin and other parts, and lead the deluded invalid to believe that he is really recovering health, when in fact, he is only exchanging one form of disease for another; and by means of making the new disease more active than the old one.—In such cases, if the ailment is simply symptomatic, from over-eating or other dietetic errors, and no particular organ is actually diseased, the powerful drenching and evacuation, will remove the symptoms for the time, and the individual may return home believing himself to be restored to health; and if afterwards he becomes more temperate and otherwise correct in his dietetic habits, he may never have a return of those symptoms; but if he continues in his old habits, he will inevitably have a return of them or others more distressing; and he is always the more liable to a return of them, in proportion to the effect which the mineral waters had on his system.—But, if the individual is actually laboring under chronic disease, however completely the drenching may, for the time, subdue the symptoms, if he does not

afterward avoid the causes by which his disease was originated and perpetuated, it will, with the certainty of death, come back upon him, greatly increased by the effect of the mineral water; or else, some new disease will supervene, more painful and more incurable than the first; and which is either caused or greatly modified by the means used to remove the first. So that, in every instance—I repeat it solemnly!—*in every instance, the direct and immediate effect of mineral waters on the human body is injurious*:—and where such waters are freely used for any considerable time, the injury is serious and permanent.—The digestive organs are always debilitated, and sometimes completely prostrated:—indeed, the whole tone and energy of the system are impaired:—and where one individual is benefited in the result, thousands are greatly injured!—The delusion is deep and broad on this subject, and I have no hope of dispelling it:—but I must speak the truth from the fulness of my heart, even though it may never be heeded.

§ 1535. The only drink that God has made for man therefore, and the only drink than man can ever use in perfect accordance with the vital properties and laws of his nature, is **PURE WATER**; (§ 1513. 1516.) and this is best supplied by the juices of such fruits and succulent vegetables as compose a part of the natural food of man; (§ 1521.) and they pursue the wisest course of life, whose dietetic and other habits are such that the aqueous matter which the vital economy of their system requires, is abundantly furnished by their regular food. Yet, if by any means, water in its separate form is rendered necessary as a drink,—and indeed, for any other application to the human body, and for the preparation of food, it is of exceedingly great importance that it should be as pure as possible.—Some families are

greatly blessed with a well or spring which furnishes them with excellent water;—some bring it from a distance in aqueducts, and some cities and towns are supplied by rivers or large streams or ponds.—In all these ways, if the aqueducts are of a proper kind and construction, water may be furnished which is very good, and especially, if it be filtered before used. Some take the pains to distil all the water that they use; and if the water which they put into their kettles is wholly free from any vegetable or animal matter, they will obtain the most perfectly pure water in this way; but if the water which they put into their kettles contains any vegetable or animal substances, some of their properties will rise with the vapor, and qualify the water which is received from the still.—So that, on the whole, they who cannot otherwise be well furnished, will probably do best to depend on the cistern, and the clouds. For, rain-water, when it is pure, is the most delicious and wholesome that can possibly be procured.—To secure such water, some have two stone or brick cisterns, so constructed that water will filter from one into the other.—Others have two, and receive the first of the rain into one till the atmosphere and the roof are cleansed, and then receive it into the other for drinking and culinary purposes. Others, again, have one good stone or brick cistern, with pipes so constructed and arranged, that every heavy rain will wholly drive out the water previously contained in the cistern and fill it with a fresh supply. In either of these ways, with proper care, excellent water may be had the year around;—but every family that uses rain or river water, should be furnished with a first rate filter, through which all their water should pass before they use it:—and those who cannot procure such a filter from New York or Boston, or elsewhere, can easily

construct one for themselves with gravel and sand and charcoal, which will be far better than none.—But they who have a good cistern, well supplied with water from the clouds, and a good filter to purify it for their use, can have the most delicious and healthful drink that human beings need, or can enjoy: and they who can by any reasonable pains and expense provide such drink, are bound by every consideration of health and morality, to do so.—By adding to their cistern a good ice-house, they may have their drink as cool during the warm weather as they wish. But I repeat that they are wisest who so live as to require little drink of any kind.

Times of Drinking.

§ 1536. If man were as simple and as true to the laws and instincts of his nature as the lower animals, it would be of comparatively little importance at what time he drank, so that, it was always in obedience to the truly instinctive demand of his vital economy. But in civic life, where many causes are co-operating to depress the physiological powers of the human body, and particularly to debilitate the digestive organs, it becomes of much importance that the times of drinking should be properly regulated.—In regard to alimentation, we have seen (§ 426. 726.) that the best interests of the system, require that the food should be perfectly masticated, and mixed with the salivary fluid before it is swallowed.—We have seen also, (§ 429.) that when food is received into the gastric cavity in a proper condition, the stomach secretes a solvent fluid which, by the muscular action of the organ, is thoroughly mixed with the food for the purpose of digestion; and that (§ 450.) when the food is received in a fluid state, containing considerable aqueous

matter, the water is first absorbed and then the gastric secretion and digestion commence: (§ 1291.) because, if the gastric juice were to mix with the water, it would be so much diluted that its solvent power would be wholly destroyed. Hence, if in the midst of a meal, or after a meal is completed, a portion of water or other drink is received into a vigorous stomach,—and more particularly if true thirst is felt, (§ 1517.) the organ suddenly and powerfully contracts upon the food and presses it into the pyloric, or small end, (§ 341.) and by the contraction of a number of the circular fibres of the muscular coat, (§ 347.) which gives the stomach somewhat the appearance of an hour-glass, the food is held there, till the fluid, which is received into the splenic or large end, (§ 382.) is absorbed,—which is done as rapidly as possible, and then the circular fibres relax and the regular function of the stomach goes on, with little interruption or embarrassment.—But, if, instead of properly chewing our food, and mixing it with the fluid of the mouth, we continually wash it down with some liquid, or, between every two or three mouthfuls of food, take a small portion of drink, the fluid and solid ingesta are so thoroughly mixed together that the process of digestion cannot commence till the meal is completed and all the liquid removed by absorption: (§ 452.)—and this leaves the alimentary contents of the gastric cavity, much more dry and compact than if no drink had been taken: (1291.) and thus we greatly retard and embarrass the function of the stomach and serve to debilitate, relax and break down that organ. Yet while the stomach continues to be vigorous and active, all this may be done, without any appreciable symptoms of gastric embarrassment: but never without more or less real detriment to the organ and its function.—In that state of gastric debility however, which is almost universal in civic

life, the case is very different;—the fluid received into the stomach during the ingestion of food, is very slowly and with great difficulty absorbed; and if the food, with little mastication and insalivation, is continually washed down with some kind of drink, the process of digestion, instead of commencing immediately, as it ought to do, will be delayed for half an hour or an hour and sometimes even longer, till the relaxed and debilitated absorbents can remove the fluid and bring the food into a consistence proper for the action of the gastric juice: (§ 1291.) and now the food, instead of being properly mixed with saliva, (§ 426.) and thoroughly saturated with healthy gastric juice as it came into the stomach, mouthful by mouthful, (§ 429.) lies in an oppressive and almost impenetrable mass, and the already wearied organ must, if possible, in its relaxation and lassitude, secrete a sufficient quantity of solvent fluid to digest it. But in this state, the stomach is poorly fitted to secrete a healthy and energetic fluid: and therefore, it is not surprising that under such embarrassments the vital powers of the debilitated and worried organ, are not able to control the inorganic affinities, (§ 131.) but suffer them to become active in the formation of gases and acids, which by their acrid and irritating properties, create a morbid and intense thirst, which vehemently asks for some liquid to dilute those acrid substances (1530.) and almost irresistibly compels us to drink.—If however, in this state of things, we yield to the morbid demand, and take a quantity of water, or any other liquid, into the gastric cavity, the feeble organ cannot, like the vigorous stomach, contract upon its contents, and save them from the inundation; but the flood will come down and sweep over the entire mass, and reduce it to a more unmanageable wash than it was at first:—and then will follow a distressing sense of distension, attend-

ed frequently, with eructations and belchings; and often a part of the crude contents of the stomach, are spasmodically thrown up, and a part perhaps, ejected into the intestines to produce irritations, flatulence, colic, &c. (§ 436.) This is a true description of what, every day, takes place in civic life, in hundreds of individuals: and if all who indulge in the mischievous practice of washing down their food with liquids of any kind, do not experience all these evil consequences, they may be assured the practice always tends to such results.

§ 1537. If the use of even pure cold water with our food in the manner I have described, is incompatible with the physiological interests of our bodies, and the cause of functional disturbance and organic debility, much more is that water objectionable, when it is habitually used hot, for the same purposes and in the same manner. As with our food (§ 1321.) so with our drink, every thing taken into the mouth and stomach in a higher temperature than our blood, is relaxing and debilitating to the parts on which it acts, and through them to the whole system. The teeth and every other organ and part in the oral cavity, are injured by hot drinks; (§ 724.) the throat and œsophagus and stomach are relaxed and debilitated by them.—In short, as we have seen, (§ 1321.) every part of the system is, in some measure, relaxed and debilitated and rendered more liable to disease, by the dietetic use of any thing in an elevated temperature: and if, instead of hot water or milk and water, we use tea or coffee or chocolate or any other made beverage, the mischievous effects on our digestive organs are still greater, and always in proportion as the qualities of those beverages are more or less unfriendly to the vital powers of our bodies.—Tea and coffee and wine and all other narcotic and alcoholic beverages are exceedingly deleterious,—but as I

shall have occasion to speak of them more particularly in another place, it is not necessary to say more concerning them now.

§ 1538. On the whole then, in regard to the drink of man, it were best, and most truly natural, if his dietetic and other habits were such that the demand of his vital economy for water, were fully answered by the aqueous juices of the fruits and vegetables which properly composed a portion of his food. (§ 1521.) But if he *must* have drink, every law and property of his nature unequivocally declares that it should be the most perfectly pure water: and that he should not drink it warmer than his blood: and as a general rule, it is better that it should be considerably cooler. It can be too cold, but with people in health and of good habits, there is very little danger in this direction.—It is also, fully evident that as a general rule, drink should not be taken with the food, nor too soon after eating. It is far better, if one is thirsty, to take a draught of pure cold water some twenty or thirty minutes before eating, or three or four hours after the meal; and they who are regular in their habits can regulate their thirst with perfect ease and comfort. An individual whose dietetic habits are tolerably correct, may soon accustom himself to take a glass of water in the evening or morning, or any other hour in the day he chooses, and only at that one hour; and he will feel his thirst return regularly at that period, and never trouble him at any other time, unless occasioned by something extraordinary. (§ 1528.) They who are tormented by a morbid thirst produced by gastric irritation from too much or from improper food, (§ 1529.) had far better take active exercise in the open air, than drink.—The cool fresh air upon their skin will greatly abate the fever of their stomach, (§ 291.) and thus alleviate their thirst; and

exercise will increase the action of the stomach and enable it to digest or to reject its contents: and then, let them be more careful to avoid transgression.

Seasonings, Condiments, and Stimulants.

§ 1539. The human body, we have seen, (§ 106. *et seq.*) is composed of the common matter of the world, converted into animal arrangement and structure by vital forces, which overcome and subdue the more primitive affinities of inorganic matter. (§ 107. *et seq.*) We have seen also, (§ 314.) that the matter of our bodies is not permanent in its organic arrangement, but particle by particle, is continually escaping from the vital structure, and returning to inorganic forms: (§ 117.) and hence, the necessity for constant supplies of new matter to replace that which is eliminated from the vital domain. (§ 1476.) Our bodies therefore, consist of an assemblage of organs (§ 121.) so constructed and adjusted as to form of the whole, a single system, (§ 314. *et seq.*) and each of these organs performs its particular function—not for itself *alone*, but for the whole—as a constituent part of the one system, (§ 697. *et seq.*) and the associated functions of all the organs, constitute the single vital economy of the system, (§ 312.) by which the body is nourished and sustained in all its physiological properties and powers.—The organic wants of our bodies, and consequently, the purposes for which their organs were constructed, require vital power and action in the organs: and vital action requires that the living organs should be susceptible of being excited by appropriate stimuli; (§ 305.)—and hence, as we have seen, (§ 312.) every organ in which vital action is required, is furnished with tissues whose vital properties endow it with the necessary powers for the performance

of its function: and thus every acting organ in the system, is constituted with vital sensibilities that fit it to be excited by those substances which it was constructed to receive and act upon. (§ 296.)—A certain degree of action, in the several organs, is therefore, necessary for the sustenance of the body and the maintenance of life: and such is the general sympathy of every organ with each other in the whole assemblage, and all with each, (§ 230. 296.—305.) that no one organ can greatly fall short, nor greatly exceed its proper rate and tone of action, without in some measure involving the whole system, and causing a correspondent disturbance in the general economy of the vital domain. And although, as we have seen, (§ 294.) the animal centre of perception has, in the ordinary state of the system, no cognizance of the particular actions and conditions of the several organs in the domain of organic life, yet the cerebro-spinal system, (§ 228.) sympathizing directly and powerfully with that domain, in all its affections and conditions, (§ 293.—305.) the animal is conscious of satisfaction and enjoyment, or depression and disquietude, according as the general tone of the organic economy comes up to, or falls short of the usual healthy standard.—And consequently, as we have seen, (§ 305.) when the system is in perfect health, and each organ is healthfully acting under the influence of its appropriate stimulus, the physiological wants of the organic economy are satisfied, a grateful communion of sympathy pervades the whole system, and mental tranquillity or perhaps delight is the natural result. (§ 575.) If by any means to which the system is adapted and accustomed, the stimulation is somewhat increased, and the general tone elevated, the sympathetic mental consciousness or feeling amounts to exhilaration, and perhaps high enjoyment: and on the other hand, if by any means, the

general tone be depressed, the sympathetic mental consciousness or feeling is commensurately unpleasant and distressing, and the individual feels a corresponding degree of dissatisfaction and disquietude, which is promptly removed, and satisfaction afforded by the requisite degree of stimulation. Hence, it may be said that there is in man and all animals A NATURAL LOVE OF STIMULATION.

§ 1540. But the vital sensibilities by which our organs are rendered susceptible to the action of appropriate stimuli, also render them susceptible to the action of other and improper stimuli.—In the natural constitution of man, all the animal and organic sensibilities, (§ 292. *et seq.*) are established with precise and determinate relations to the physiological interests of the body, and to the nature and qualities of the substances designed to act on the living tissues of the organs. (§ 699. *et seq.*) Thus, as we have seen, (§ 300. 960.) the organic sensibilities of the stomach, not only render that organ capable of being excited to action by appropriate stimuli; but they render it capable of being excited to even the most powerful and violent action, by improper and offending, and pernicious substances.

§ 1541. In the perfectly healthy and undepraved state of the stomach, its sensibilities enable it with the nicest and most discriminating accuracy, to perceive and appreciate both the *quality of the stimulus* and the *degree of stimulation*; (§ 296. 736. 737. 960.) but the habitual introduction of improper substances into the gastric cavity, so depraves its sensibilities that it often wholly *loses its discriminating power to perceive the quality of the stimulus, and only retains the ability to appreciate the degree of stimulation.* (§ 738.) By the same means also, its delicate susceptibility to the action of its natural and appropriate stimuli, is so impaired, that the latter fail to

excite sufficient action in the organ to keep up its proper tone, and to satisfy the demands of the organic economy; and the consequence is that a physiological depression of the organ results, (§ 1190. Note) which involves the whole domain of organic life; and the sympathy of the cerebro-spinal system with this depression, (§ 228.) becomes a mental consciousness of dissatisfaction, disquietude and distress, which must either be borne till the vital economy recovers the stomach from its depravity, and restores it to its healthy susceptibility, or be removed by the use of the stimulus by which the depravity has been produced, or by some other stimulus equally powerful.—Thus, while the stomach is healthy and undepraved, the simplest and plainest food excites it to the vigorous performance of its function; and there is no want of tone in the organ, and no physiological dissatisfaction is felt in the system, and no mental disquietude results.—If, in this state of things, a sufficient quantity of tobacco or any other poison is introduced into the gastric cavity to endanger life very imminently, its poisonous property is instantly perceived, and the sympathetic alarm is promptly given to the whole domain of organic life, (§ 225.) and, as we have seen, (§ 300. 960.) the most violent vital reaction takes place; but if a very small portion of tobacco be introduced at first,—not enough to endanger life, nor greatly to disturb the function of the stomach, very little or no alarm will be given to the organic domain at large, but the stomach will, as it were, endeavor to keep its little troubles to itself, and by its own special economy, (§ 1551.) protect itself and the vital domain as far as possible, from its deleterious qualities. Yet always, and inevitably, just in proportion to the pernicious quality and energy of the tobacco, the discriminating sensibility of the stomach is impaired; and the organ is commensurately less suscepti-

ble to the action of plain and simple aliment, and less nice to perceive the poisonous properties of the tobacco.

§ 1542. If the effect is small, and no more tobacco is introduced into the gastric cavity, the vital economy will soon recover the organ from the injury and restore it to its healthy sensibility. But, if before this is effected, a little larger quantity of tobacco is taken, the stomach, having less power to perceive its poisonous properties, will give no more alarm than it did before, with the less quantity: —and if this course be followed up for a short time, gradually increasing the quantity of the tobacco, the discriminating sensibility of the stomach will be so much depraved that it will no longer be able to perceive the quality of the stimulus and only able to appreciate the degree of stimulation: (§ 738.)—and this discriminating sensibility of the stomach being destroyed, there remains no other instinctive means by which the poisonous character of the tobacco can be detected in the gastric cavity.—If now the tobacco be entirely withheld, and the depraved stomach be left to its own resources and the action of its natural and appropriate stimuli, these will wholly fail to keep up the tone of the organ, and the necessary consequence will be a physiological depression corresponding with the depth and extent of the depravity, and involving the whole domain of organic life, (§ 228.) and sympathetically producing a proportionate degree of mental disquiet and distress.

§ 1543. But the mind cannot be conscious that the tobacco has produced its distress, nor that it is suffering from the want of physiological tone in the stomach, or any other organ. (§ 305.) It is only conscious of its own distress, which it naturally attributes to some purely mental or moral cause acting directly on itself. (§ 575.) The depraved stomach however, craves its accustomed

stimulus, with a vehemence equal to the depth of its depravity and the degree of its physiological depression; and if the requisite quantity of tobacco be introduced into it, immediately its tone is restored, the physiological depression removed, and the mental disquietude dispelled.—But the mind cannot be conscious that it derives its relief from the action of a poisonous substance on the stomach, nor that it is in any measure affected by the condition of any bodily organ. (§ 586.) The stomach no longer perceives the poisonous quality of the tobacco:—it only appreciates the degree of stimulation which the tobacco produces, and *in that degree of stimulation*, the stomach blindly rejoices, and the whole organic domain sympathetically rejoices with it; (§ 297.) and in this general physiological exhilaration the mind rejoices also, though utterly unconscious of the source of its delight. (§ 587.) But, the mind, not from its consciousness, but from the exercise of its reasoning powers, will soon discover that its disquietude follows the abstraction of the tobacco, and its satisfaction or delight follows the use of it; and, judging, not from any knowledge of the physiological powers and laws of the body, and of the properties of the tobacco, but wholly from its own consciousness of disquietude when the tobacco is withheld, and satisfaction when it is used, it naturally and necessarily comes to the conclusion, that the tobacco is not only innoxious but highly salutary: and thus man is brought to the full belief that tobacco is greatly conducive to his health and comfort: and feels himself fully confirmed in this opinion by the very best and most infallible means of knowledge—*his own experience.*

§ 1544. This same reasoning strictly applies to the physiological and psychological effect of all other pure

stimulants on the human system. (§ 889.)—In every case, by so much as they increase vital action, they cause the vital expenditure (§ 376.) to be in excess of the immediate vital replenishment; (§ 891.) and the necessary consequence is a commensurate physiological depression, or “indirect debility,” as it is called in medical works.—In every case also, in proportion to the deleteriousness of the substance used, the vital sensibility of the organ on which it acts, is impaired and depraved: and the organ loses the power to perceive the quality of the stimulus and only retains the ability to appreciate the degree of stimulation.—Moreover, in exact proportion as any organ becomes depraved by any particular kind of stimulus it loses its susceptibility to the stimulating properties of other substances, (§ 711.) and becomes dependent on that particular kind, for a satisfactory degree of stimulation, and is depressed and dissatisfied if that accustomed stimulus is withheld; and in its depression, involves, to some extent, as we have seen, (§ 1542.) all the physiological and psychological powers of the system. This constitutes the power of such acquired appetites, and renders it exceedingly difficult to subdue and remove them.—And always, when the system has become habituated to any stimulating substance, the depth of the depravity caused by its use, the depression and dissatisfaction experienced if it is withheld, and the difficulty of subduing the appetite for it, are in proportion to the deleteriousness of the substance, and the natural and instinctive antipathy of the pure and healthy vital powers, to its poisonous properties.

§ 1545. But as the discriminating sensibility by which any organ is enabled to perceive the poisonous properties of substances which act upon it, are soon destroyed by the habitual use of such substances, (§ 706.) and as the

degree of stimulation, is all that is appreciated by the general organic economy, and all that affects the mental consciousness, so the physiological satisfaction and the mental enjoyment and delight, always correspond with *the degree of stimulation*, without any regard to the *quality* of the stimulus.—And as the most deleterious substances cause the deepest depravity of the organs on which they act, and as their stimulation is attended with the greatest expenditure of the vital powers, and is consequently followed by the greatest degree of physiological depression and mental disquietude, so the depraved appetite, formed by the use of such substances, is most importunate and despotic and most exclusive in its demand for the particular kind of substance by which it was formed, and that particular kind of substance becomes most exclusively essential to the production of the requisite degree of stimulation. And hence, in proportion to the deleteriousness of any substance on which the system has become dependent for stimulation, the mind, judging from its own-consciousness, (§ 1543.) regards that substance as essential to its own comfort and enjoyment, and to the welfare of the body:—and as such substances, when the system is deeply depraved by them, are always used in gratification of the most importunate appetite, and as their stimulation removes the most distressing physiological depression, caused by their own depraving and exhausting influence, so their stimulation is regarded as the most grateful and delightful of all the enjoyments of life, and the substances themselves often become of more importance, in the estimation of the mind, than any thing else, affecting human existence.

§ 1546. The explanation of these physiological principles, fully discloses to us the philosophy of the universal and deeply melancholy fact of man's propensity to

indulge excessively in the use of stimulating and intoxicating substance. (§ 778.) By over exertion of the body, or over action of the mind, or by dietetic errors in the quantity or quality of food, or by some other cause, (§ 520.) the nice balance of the physiological actions of the body is disturbed,—a corresponding physiological depression is produced, and a commensurate disquietude is felt.—If in this state of things, man fully understood himself, and were wise, he would patiently bear the light and momentary disquietude, till the renovating powers of his vital economy restored the balance of action and thus removed his distress. (§ 1429.) But unhappily, man knows not himself!—and—what is yet more his fault than his misfortune—he seeks not, with proper diligence and in a proper manner, to know himself. And in his ignorance, if, by any means, he experiences a physiological depression and consequent disquietude, he is at once, impatient to be relieved, and eagerly avails himself of any thing that promises the most speedy alleviation.—Purely by accident at first, he discovers that certain substances, if taken into his stomach, exhilarate him, and remove his depression; (§ 890.) but upon what principle, he has no idea; (§ 1543.) nor does he give himself any care to ascertain. It is enough for him to know that, when he is fatigued or in any manner depressed, if he takes the substances in suitable quantities, he is relieved and perhaps made happy. The olfactory and gustatory (§ 700. *et seq.*) and organic sensibilities (§ 296. 737.) alone, can perceive and appreciate the qualities of the substances, with reference to the physiological interests of the body; and these, we have seen, are soon depraved by the action of those substances, and the system only retains the ability to appreciate the degree of stimulation; and that is the very thing that affords the satisfaction and delight;

while at the same time, its effects upon the system destroy the physiological and mental ability of the individual to be satisfied with the action of the natural and appropriate stimuli, (§ 1541.) and cause a more and more frequent and distressing physiological depression and consequent demand for stimulation. But man in his ignorance, and in the blindness of his sensuality, knows nothing of the physiological philosophy of all this.—He neither knows nor suspects that the frequency and depth of his disquietude are caused, in any measure, by the substances which he uses to remove that disquietude.—He only knows from his *experience*, (§ 37.) whose integrity he can no more doubt than he can doubt his existence, (§ 1543.) that whenever he feels depressed and disquieted, the use of those substances affords him relief and satisfaction and enjoyment;—and therefore, he fully believes them to be salutary cordials, which do him good, and only good.

§ 1547. Thus man, in his blindness and delusion, goes on, from the occasional, to the habitual use of his stimulants, till he brings his system into such a state of general physiological depravity, and renders it so subject to physiological depression, that its natural and appropriate stimuli (§ 305.) no longer serve to keep up its tone, in any respect, nor to satisfy its demands for stimulation: (§ 1541.) and the result is that nothing simple and unexciting in his food or drink, satisfies his depraved appetite and morbid craving for stimulation: and, therefore, he blindly multiplies the kinds of his stimulants and increases the quantity, with the increasing depravity and demand of his system, without knowing or suspecting the consequences, till every thing in his diet,—every thing he swallows, is, either of its own nature, or by the addition of other substances, pungent and exciting; and this inevitably, soon brings the system into a con-

dition, in which its exhaustion is so rapid, and its consequent depression so deep and distressing, that it can no longer be satisfied with the mere dietetic use of stimulants, but must be kept continually under their influence; and as the more freely such substances are used, the more rapidly and powerfully they exhaust and destroy the susceptibilities of the system, even to their own influence. So the infatuated self-destroyer is driven on to the use of more and more powerful and pernicious substances, till he exhausts the resources of nature, and of human ingenuity, in making himself a miserable, and yet utterly deluded drunkard and degraded sot!—And from the beginning to the end of this career of self-destruction, man is compelled along his course, by a necessity which he voluntarily generates as he proceeds; and at every step, he is ready, in the full sincerity of his soul, to swear by all in earth and heaven, that his own *experience*, which is the most infallible criterion of truth that man can have, fully demonstrates the correctness of his habits, and proves not only that his stimulants are innoxious, but that they are salutary and necessary for his comfort, and for the continuance of his life.

§ 1548. There is therefore, in man a natural aptitude and powerful tendency to become a drunkard, and to destroy himself by the use of stimulating and intoxicating substances. Hence, in all periods of time and all portions of the world, it has been universally true of the human species, that the means of stimulation and intoxication, have been among the first discoveries and inventions of the earliest stages of society: and nearly every tribe and nation, have indulged in the use of those means, without suspecting the consequences, till almost universal drunkenness was the result:—and when, by enlarged experience, and by the sagacious observation of the more

intelligent and philanthropic members of society, the relation between such excesses and their evil effects, has been discovered, the depraved appetite of the body and the delusion of the mind (§ 586. 608.) have proved too mighty for the restraints of civil law; or, at most, the excesses have only been restrained in a very small measure, by the severest exercise of civil power.— Among the bloodiest and most terrible laws to be found in the codes of nearly every nation that has inhabited the earth, are those which in the earliest stages of their civilization, were enacted and enforced against excesses in the use of intoxicating substances.—And yet, where such laws have been most sanguinary and most terrible, the nations, after having risen to what is considered the highest state of refinement in civilization, have, mainly through excesses of this kind, declined and perished in general drunkenness.—Ancient Greece and Rome are, in this respect, but striking illustrations of the general history of the human race.—Indeed, all means, both human and divine, have hitherto failed to restrain mankind from excessive indulgence in stimulating and intoxicating substances.—The general diffusion of that knowledge which leads to self-restraint, has ever been, and from the nature of things, must ever be the only means which can in any measure reclaim man from this deep and universal depravity and delusion. So fast as the people of any state or nation have become sufficiently intelligent to perceive and understand the consequences of an excessive indulgence in the use of stimulating and intoxicating substances, they have, as a general fact, restrained themselves within narrower and narrower limits of indulgence, in proportion to their intelligence and the truth and extent of their convictions.—But where the depravity is universal, and the appetite for

stimulating and intoxicating substances is engrafted, as it were, upon the very constitution, by hereditary influence and perpetual habit, (§ 1428.) it is a most difficult thing to produce the conviction that such indulgences are incompatible with human happiness, and health and life, and sound morality and true religion.—Hence, even in the most enlightened state or nation upon earth, the people have as yet, only become sufficiently intelligent to understand the relation between the excessive use of the most powerful intoxicating substances and their most violent effects:—and in proportion to the fulness of this conviction, they restrain themselves from actual drunkenness:—but they do not perceive and understand the relation between the use of all intoxicating—all purely stimulating substances, and their immediate and ultimate physiological and pathological effects upon the human body; and therefore, while they, perhaps, restrain themselves entirely from the use of certain intoxicating substances, whose ruinous effects have become too well known to be denied or doubted, they indulge themselves, with little or no restraint, in almost every other kind of stimulating and intoxicating substances, whose mischievous effects they have not yet been *forced* to perceive and understand:—and hence, the universal fact, that human beings even in the most enlightened portions of the world, habitually and almost continually indulge in the use of a great variety of stimulating and intoxicating substances, to render their diet gratifying to a depraved appetite (§ 712.) and to keep up a satisfactory degree of stimulation in their systems!

§ 1549. All stimulants, I have said, (§ 894.) increase the vital action of parts with which they come in contact, and when they are powerful, and the quantity considerable, and the organ or part on which they act, an impor-

tant one,—such as the stomach, their local effect is sympathetically felt by the whole organic domain, (§ 298.) and the whole system is thrown into an increased action, by sympathetic excitement or irritation. Substances that act in this manner, are called *local stimulants*. Others are rapidly taken up by the absorbents, (§ 452.) and diffused throughout the body, exciting every part to increased action by their immediate presence. These are called *diffusible stimulants*.—But, while the stimulation produced by these different substances, when the system is accustomed to them, is identified in the mental consciousness (§ 1543.) with that which is produced by the natural and appropriate stimuli, giving a sense of satisfaction and increased vigor and enjoyment, (§ 1545.) yet the physiological action which they cause, is of a very different character.—The natural and appropriate stimuli of the system, (§ 305.) always excite the parts on which they act, to the performance of their function, and the stimulation which they produce, increases the functional energy of the organs. But the action caused by those foreign substances which are used purely for their stimulating effect, is the action of vital resistance, (§ 300.) or what is called vital reaction: (§ 960.)—a rallying of the vital forces to resist and repel, and expel the offending and disturbing cause. This stimulation therefore, while it lasts, though it increases the feeling of strength, and to some extent the muscular power of voluntary action, (§ 890.) yet it never, in any case, increases the functional energy of any of the organs concerned in assimilation and nutrition; but on the contrary, always diminishes the functional power of those organs, and retards their functions, and deteriorates their functional results. On this important point, medical men have fallen into an exceedingly great error of opinion, which has been the source

of incalculable mischief in medical practice and dietetic regimen.

Salt.

§ 1550. SALT has probably been more universally employed as an article of diet, by mankind, from the primitive ages to the present day, than any other pure stimulant, or substance which is used simply for its exciting property. It can hardly be considered remarkable therefore, that at a very early period in the history of the human family, this substance came to be considered as essential to the comfort and the health of man; nor even that, in later times, the opinion should be very generally entertained by those nations who use salt, that, an entire and protracted abstinence from it, would inevitably destroy life. But it is somewhat remarkable that, scientific men, and particularly those who have given their attention to physiology, chemistry, medicine, &c., have not long before this discovered and disclosed the error of such opinions.

§ 1551. Salt is a mineral substance, and is wholly in-nutritious and indigestible. If a table spoonful of it be dissolved in half of a pint of water, and introduced into the human stomach, it is immediately perceived by the organic sensibilities of that organ (§ 296.) as an offending or disturbing substance:—great irritation is produced:—the vital forces, if not exceedingly impaired, (§ 960.) react with energy:—mucous and serous secretions are rapidly increased in the gastric cavity, to protect the mucous membrane (§ 338.) from its acrid and irritating qualities;—much distress is experienced by the individual, and nausea and vomiting generally succeed, as an instinctive means of expelling the offending cause from the vital domain: and, in all cases, considerable portions of it are

driven through the pyloric orifice, (§ 341.) into the intestines, where great irritation is also produced by it, and it is soon expelled from the bowels, with large quantities of serum, secreted from the blood, to dilute and flood away the irritating substance; and thus protect the living parts on which it acts, and the vital interests of the system generally, from its pernicious effects. (§ 1515.) When salt is taken into the stomach in small quantities, with food, the result is somewhat different. If the stomach is perfectly healthy, in all its properties and powers, (§ 312.) however small the quantity of salt, it is immediately detected by the undravaged sensibilities of the organ, and a vital reaction takes place, corresponding in energy and extensiveness with the quantity and strength of the offending substance, (§ 300.) and by the mucous and serous secretions which are promptly produced, the parts are protected, and the salt is so diluted as to be rendered no longer very dangerous to the delicate vital properties of the tissues on which it may act. It is therefore, not expelled from the alimentary cavity, by vomiting nor purging, but is taken up in a state of solution, by the absorbents of the stomach, (§ 452.) and mingled with the blood of the portal veins: (§ 458.) not in any case, nor degree, however, to supply the wants of the vital economy, but to be expelled from the vital domain, through the kidneys, lungs, skin and other depurating organs of the system, as a foreign substance. (§ 516.) By the long and habitual use of this substance however, the organic sensibilities of the stomach, and of all the other parts of the system, become so much impaired by its qualities, that, they no longer make so energetic a resistance to it, as when they are healthy and undravaged, and the salt is gradually permitted to pass more and more freely, into the general circulation, and be diffused

throughout the whole vital domain, (§ 458.)—pervading the minute vessels of the glands and other parts, and becoming so permanent a quality of the serum of the blood, as to be regarded by many, as an evidence of the necessity for its dietetic use.

§ 1552. The facts in regard to the dietetic use of salt then, are these: 1. Salt is wholly innutritious;—it affords no nourishment to any structure or substance of the human body;—2. it is utterly indigestible;—it enters the body as a mineral substance,—it is absorbed unchanged, as a mineral substance,—it goes the rounds of the general circulation as an unassimilated, mineral substance, and is finally, eliminated from the body, through the kidneys, lungs, skin, &c., as an unassimilated, mineral substance: —3. its acrid quality is offensive to the vital sensibilities of the organs,—always causing vital reaction or resistance; and *this vital reaction constitutes the only stimulation ever produced by salt*; and is therefore, always attended with a commensurate degree of irritation and vital expenditure, and followed by a correspondent degree of indirect debility and atony: and consequently it always and inevitably tends to produce chronic debility, preternatural irritability and disease:—the stomach, intestines, absorbents, veins, heart, arteries, and all the other organs of the system, are always irritated, exhausted, and debilitated by its presence.—4. It never, in any measure, promotes digestion nor any of the assimilating functions of the system; on the contrary, it always retards those functions, and is unfavorable to all the vital changes. (§1292.) Where a stomach has been greatly debauched and its energies prostrated, the sudden and entire abstraction of salt and all other stimulants from the food, would undoubtedly leave that organ in a temporary state of atony or depression, which would unfit it for the performance of its function. But

it is entirely certain that, in a stomach whose powers and sensibilities are unimpaired and healthy, salt always retards digestion and embarrasses the function, and diminishes the functional powers of the organ: and the impaired stomach receives tone from it, only upon a principle, which is always, and inevitably, unfriendly to its own physiological interest and to those of the system in general. (§ 889.) And this is all true of every other assimilating function and process of the vital economy, and hence it is a well ascertained truth in the science of physiology, that the dietetic use of salt is unfriendly to all the processes of assimilation, nutrition and secretion, in the vital economy.—5. It always, in proportion to the freedom with which it is used, diminishes gustatory enjoyment. (§ 711.) It is true that, there are some substances eaten by man, whose qualities are such that, they are rendered more tolerable by the use of salt, than they would be without it; but it is nevertheless true that the use of salt with those substances, always and necessarily impairs the nicely discriminating power of the organ of taste, and takes away the delicate perception of the agreeable qualities of more proper food, (§ 708.) and thereby, on the whole, immeasurably diminishes the amount of gustatory enjoyment in the course of an ordinary life.—Incredible as this may appear to many, every intelligent individual may demonstrate its truth by three months' fair experiment.

§ 1553. But we are told of the great abundance of salt in nature—of the instinct of some of the lower animals, which prompts them to go a great distance to procure it—of its necessity to preserve the lives of some of the domesticated animals, and of the Scripture authority for its use in human diet.—All these points I have carefully examined, and from the examination, am the more

fully convinced that salt is not a necessary, nor a proper article for the dietetic use of man. Its great abundance in nature affords no evidence either for or against the propriety of man's using it as an article of diet.—As to the instinct of the lower animals, it is not true that there is any animal in nature, whose natural history is known to man, which instinctively makes a dietetic use of salt. It is true that some herbivorous animals, such as the deer, when they are diseased by worms, grubs or bots, in the alimentary cavity, will instinctively go in pursuit of salt,—not as an article of diet—not as a seasoning to their food, but purely as a medicine to destroy the animals in their stomachs; and they never instinctively use it at any other time nor for any other purposes. It is true also, that domesticated animals are subject to diseases, for which salt is perhaps, the best and most natural medicine in the world; but it is not true that they require it for any other purpose; nor is it true that they will be less healthy if they are not regularly fed with salt.—In regard to the Scripture authority, it amounts to this, and nothing more:—salt, when good, is an antiseptic, and preserves those substances on which it acts, from putrefaction; and good men have a similar effect upon the moral world; but when salt has lost its antiseptic property, it is good for nothing, and when men who profess to be good, exert no *antiseptic* influence on the moral world around them, they are like salt that has lost its savor.

§ 1554. It is a little remarkable, that some have contended for the necessity for salt, as an article in the diet of man, to counteract the putrescent tendency of animal food, or flesh-meat, when there is not a carnivorous animal in nature that ever uses a particle of it, and few, if any of the purely flesh-eating portions of the human family ever use it in any measure or manner: (§ 787.

1022.) and some portions of the human family who subsist mostly on vegetable food, wholly abstain from it. In man, as in some of the lower animals, salt is undoubtedly an excellent medicine for worms in the alimentary cavity:—yet, so far is the dietetic or habitual use of salt from preventing the generation of worms in the alimentary organs, that, on the contrary, it tends directly, by its irritating and debilitating effects, (§ 1552.) to produce that state of the bowels, most favorable to the generation of worms:—for, while the alimentary organs of man are healthy and vigorous, and perform their functions well, they are never infested with worms.—It is only when they are debilitated and relaxed and sluggish that they are thus annoyed; and the habitual and free use of salt tends directly to produce this state of things.

§ 1555. On the whole then, it is most evident that the best and most permanent health of the human body, does not require the dietetic use of salt—but on the contrary, the free use of it, is decidedly detrimental to the human system.—It is well known that sailors and others, when confined for a considerable time, to salted food, become afflicted with scurvy, which is always a very distressing, and often a very fatal disease. And from my own extended and careful observations during the last eight years, I have been strongly pressed to the conclusion that the dietetic use of salt is largely concerned in the production of cancers, and other glandular diseases of the human system: (§ 1533.) and I am entirely certain that it exceedingly aggravates many chronic diseases: and have little doubt that it increases the liability of the body to diseases of every kind:—that it is directly conducive to scrofulous, pulmonary and cutaneous affections, and disorders of the mucous membrane:—in short, there is every reason to believe that it not only serves to predispose the

human body to every form of disease, but also, serves to aggravate and perpetuate every species of disease when actually induced, (§ 1534.) and that it serves to hasten on a premature old age by rendering the solids dry and rigid and inelastic. (§ 691.) I am therefore, prepared to affirm with great confidence that, the well-being of the human body, does not require the dietetic use of salt:—that the free use of it, is decidedly and often seriously injurious:—and therefore, if it is used at all, it should be very sparingly, and always the less, the better.

Spices.

§ 1556. In regard to other stimulants used as seasonings with food, such as mustard, pepper, ginger,—in short, all stimulating and heating spices and condiments, they are not only unnecessary, but they are decidedly mischievous in their effects on the alimentary organs, and through them on the whole system. (§ 1544.) They always, according to their stimulating power, increase the vital exhaustion of the parts on which they act, and produce a commensurate degree of physiological depression, or indirect debility; (§ 1549.) and when habitually and freely used, they produce chronic debility and preternatural irritability, not only of the digestive organs, but of the whole system. When first received into a healthy stomach, the vital reaction (§ 960.) is so great that it always produces an inflamed aspect of the mucous membrane of that organ, (§ 338.) arising from the engorgement of its blood-vessels (§ 393.) in the effort of the stomach to protect its delicate tissues (§ 287.) from the irritating properties of the offending substances; (§ 1551.) but when the habitual use of them has greatly impaired the healthy and discriminating sensibilities of the organ,

(§ 1542.) the vital reaction is less powerful and the engorgement less excessive, while at the same time, the stomach is commensurately less susceptible to the action of its own natural and appropriate stimuli (§ 1541.) and suffers a physiological depression and want of tone if the customary stimulants are withheld; (§ 1552.) and this has led to the common, but utterly fallacious notion that these spicy seasonings promote gastric digestion.—The truth is that, every one of the pure stimulants (§ 743.) actually retards digestion, diminishes the functional power of the digestive organs, and deteriorates their functional results. (§ 454.) Some, it is true, are much less mischievous than others; but none of them is salutary nor wholly innoxious. Dr. Beaumont (§ 431. Note) found from repeated and careful experiments that, when precisely the same kinds of food were taken, at the same hour, on successive days, and in almost exactly similar conditions of the stomach, the food which was dressed with a liberal quantity of strong mustard and vinegar, was three quarters of an hour longer in digesting than that which was taken without any condiments.—And this difference, it will be recollected, was in the same stomach, which was accustomed to the use of such condiments, and therefore, could not perform its function on pure, unstimulating aliment, with the full tone and vigor of a perfectly healthy stomach which had never been thus depraved. Dr. Beaumont also found that when mustard and pepper were taken with the food, they remained in the gastric cavity, till all the food was digested, and continued to emit a strong aromatic odor to the last: and that the mucous surface of the stomach presented a slight morbid appearance towards the close of chymification.

§ 1557. It is true, as we have seen, (§ 1552.) that, when the stomach has been greatly impaired and debilitated, by

the habitual and free use of pure stimulants, and lost its power to be healthfully and vigorously excited by plain and simple food, (§ 1541.) the sudden abstraction of all seasonings from the diet, will leave the stomach in a relaxed and depressed state, which wholly unfits it for the performance of its function. But it is also true that, so long as the stimulants are used, the functional powers of the stomach, will always be impaired, and its functional results, more or less deteriorated; and the more freely they are used, the greater will be these effects;—whereas, if the stimulants are wholly abandoned, and a severely abstemious diet is adopted for a short time, with a proper regimen in other respects, the stomach will soon recover its healthy sensibilities and natural tone, and be able to digest the plainest and simplest food, with perfect ease and comfort.

§ 1558. These are therefore, well ascertained general principles in physiology:—1st, that mustard, pepper and all other stimulating and heating spices and condiments, afford no appreciable nourishment to the body: (§ 743.) —2d, that they do not assist the stomach and other assimilating organs in the performance of their functions:—3d, that they considerably retard the process of digestion, and render it less complete and perfect; and often, by greatly increasing the muscular action of the stomach, hurry the contents of the gastric cavity into the small intestine, in a comparatively crude state: (§ 436.)—4th, that the use of them, even for a single time, never fails to cause irritation and produce some degree of indirect debility of the stomach; and the habitual use of them, always causes more or less chronic debility and morbid irritability of the alimentary organs, and through them, of the whole system;—developing a general morbid irritability in the nerves of organic life—causing irregularity in the actions

of the heart and blood-vessels, and leading to debility and disease in those organs;—debilitating the brain and cerebro-spinal system generally, (§228.) inducing chronic inflammation in the mucous membrane of the alimentary and respiratory cavities, and other parts;—causing physiological depression, and creating an unhealthy hunger, and thirst, (§ 1443. 1529.) which lead to gluttony and the use of stimulating and intoxicating drinks and other substances. In short, the habitual use of these substances, always and inevitably, causes more or less irritation and exhaustion and debility in the whole system, predisposes it to diseases of every kind;—actually induces many diseases, and aggravates every disease with which the human body is afflicted;—while on the other hand, it in no measure ministers to the real comforts of man.—It diminishes his gustatory enjoyment, (§ 712.)—impairs his bodily elasticity and strength, and his animal vivacity,—takes away his mental tranquillity,—subjects him to frequent depressions of mind, and painful despondency, and increases his liability to insanity.—Red pepper, mustard, ginger, and cinnamon, are somewhat less irritating than black pepper, allspice, cloves and nutmegs; but they are all highly exciting and exhausting, and when habitually and freely used, they are all decidedly and seriously mischievous.—The stern truth is that, no purely stimulating substance of any kind, (§ 745.) can be habitually used by man, without injury to his whole nature.

Narcotics.

§ 1559. But the narcotic substances which are almost universally employed by mankind, purely for stimulating and intoxicating purposes, are far more deleterious in their nature, and when used with equal freedom, are

much more pernicious in their effects on the human system, than salt, spices and other pungent substances ordinarily used as seasonings and condiments with food.—The narcotic or intoxicating substances which have been used as means of stimulation by different portions of the human family, are somewhat numerous; but the most common, in the civilized world—and especially in our country, are tea, coffee, tobacco, opium and alcohol. (§ 778.)—Alcohol, though not commonly considered a narcotic, is nevertheless, properly classed with those substances, for its effects on the living body are essentially the same. It is produced, as we have seen, (§ 1375.) not by any formative process of nature, but by a process of decay, or the decomposition of the saccharine matter of organized bodies.—The grand characteristic of all narcotic substances, is their *anti-vital* or life-destroying property.—When they are not so highly concentrated or energetic as to destroy life instantly, they produce the most powerful and often the most violent and distressing vital re-action, (§ 300. 707.) which causes a correspondent degree of exhaustion, (§ 891.) depression and prostration: (§ 1541.)—and they often destroy life, purely by vital exhaustion in this violent and continued vital reaction. (§ 960.)—But when the discriminating sensibilities of the system (§ 1542.) have been depraved by the habitual use of these substances, and its powers of giving a sympathetic alarm greatly impaired, these same substances, even the most deadly in nature—if the quantity be only commensurate with the degree of physiological depravity, may be habitually introduced into the stomach, and even received into the general circulation (§ 458.) and diffused over the whole system, and slowly but surely destroy the constitution, and always greatly increase the liability to disease, and almost

certainly create it, and invariably aggravate it, without any of those symptoms, which are ordinarily considered as the evidences of the action of a poison on the living body:—but on the contrary, their stimulation is attended with that pleasurable feeling, (§ 1543.) and agreeable mental consciousness, (§ 1545.) which lead the mind to the strongest confidence in their salutary nature and effect. Hence, there is not a poison in the vegetable or mineral kingdom, which the human body cannot, by careful training, become so accustomed to, that it will receive into the stomach, at a single dose, without any immediate evidences of its deleterious effects, a quantity sufficient to kill, in a very few minutes, six men who have never used it.—Arsenic may be taken with food as a seasoning, as freely as table salt, with as little immediate evidence of its poisonous character: and even prussic acid, which kills instantaneously like lightning, where the body is wholly unaccustomed to its action, may with proper care, be gradually brought to act upon the human system, till it can be used with considerable freedom as a means of exhilaration and intoxication.

§ 1560. This wonderful capability of the living body to adapt itself, by physiological depravity, to the action of poisons of every kind, has not only led the infatuated human race to the excessive use of such substances as means of intoxication, but, almost as a necessary consequence, (§ 1543.) has also led them to the full belief that those substances are innoxious and salutary. Accordingly we find in every period of human history—in every portion of the world, that not only the ignorant multitude, but also the more intelligent, and to a great extent, even the members of the medical profession itself, have stoutly denied the poisonous character of those deleterious substances, which they employed as means of habitual stim-

ulation and intoxication, on the ground that they could be habitually and freely used, without producing immediate death or any of the distressing symptoms which indicate the action of a poison; but on the contrary, so far as the *feelings* can appreciate their effects, (§ 1545.) they act on the system as grateful cordials.—From an *experience* of this kind, the poisonous character of tea, coffee, tobacco, opium, alcohol and all other narcotic substances, has been boldly, boisterously, and vehemently denied, by those who habitually use them as means of stimulation and intoxication.—Even in our own land of boasted intelligence, in the middle of the nineteenth century of the Christian era, and in our very colleges of learning, the idea that alcohol is a poison, has been treated with ridicule and contempt,—as too absurd for any but a visionary fanatic to believe:—and yet, there is no truth in science more perfectly demonstrable than that alcohol is one of the most energetic and fatal poisons known to man; and with equal certainty can it be proved that tea, coffee, tobacco and opium are powerful poisons to the human body.

§ 1561. But this point is not, in any measure, to be determined by what is called *experience*, or the fact that these substances can be habitually used as means of agreeable stimulation, without producing the immediate symptoms of the action of deadly poisons: for as we have seen, (§ 1532.) if this be our criterion we are forced to the fallacious conclusion, that there is no such thing as a poison in nature. We have seen (§ 167. 312.) that the solids of the human body consist of three general tissues or forms of organic structure,—that each of these tissues is endowed with peculiar vital properties,—that these tissues compose the several organs, and their vital properties, together with the vital affinities, which are under the control

of the nervous power, (§ 204.) constitute the vital forces of the organic economy, and the functional powers of the organs.—Now then, whatever substance, by the action of its own intrinsic qualities, is immediately destructive to the vital properties and vital constitution of these tissues, is as certainly a poison, as that two and two make four.—If a real poison, in a very small quantity, or very diluted form, be brought to act on a living organ composed of these several tissues—as the stomach, for instance—the organ may, by its own peculiar economy of vital reaction, (§ 1551.) and by the co-operation of the associated organs in the general vital economy, (§ 300.) so far protect itself and the system, from the pernicious properties of the poison, as only to suffer considerable exhaustion of its vital powers, and depravity of its organic sensibilities. (§ 296.) From this state, the organ may be recovered by the renovating economy of the system. (§ 1429.) But, if the poison be at first received in a highly concentrated form, or large quantity, it will either arrest the functions of life at once, by paralyzing the nervous power; (§ 173.) or, it will produce a violent reaction, and in the terrible conflict, utterly exhaust the vital properties and destroy the vital constitution of the tissues, and death will be the result! This is therefore, the only true mode of ascertaining the properties of substances, in relation to the physiological powers of the human body: and it is a matter which has been repeatedly and fully demonstrated, that all the substances which I have named, contain a strong *anti-vital* quality, or in other words, their effect on the living body, is to destroy the vital properties and vital constitution of the tissues which compose the organs.

§ 1562. Tobacco is not only one of the most powerful, but one of the most loathsome poisons in the

vegetable kingdom:—and therefore, as we have seen, (§ 1544.) when any human being has succeeded in overcoming the strongest instinctive antipathies of his nature, and formed an appetite for this filthy weed, that appetite is extremely despotic in its power, and will not be appeased by any other stimulant, and is more difficult to overcome than almost any other depravity of the human body.—I have already so fully explained the manner in which this abominable poison affects the human system, (§ 454. 706. 707. 711. 778. 912. 961. 1428. 1541. 1542.) that it is not necessary I should say more concerning it. If what has been said will not convince man of the folly and madness of using tobacco in any form, as a means of stimulation, no human testimony will; and I have little hope that any thing I can say, will have much effect in removing so deep and so universal a depravity. (§ 778.) Opium is in all respects, so essentially like tobacco, that what is true of one, in regard to its effects on the human system, is, in general, true of the other; except that opium, being more commonly taken into the stomach, more imminently impairs the digestive organs, (§ 454.) and diffuses its mischievous influence more rapidly and extensively throughout the whole system; causing a correspondent degree of physiological prostration, and morbid irritability; and consequently, increasing the frequency and despotic energy of the demand for stimulation, and leading to greater excess in quantity, and proportionately more ruinous effects on the animal, intellectual and moral nature of man; rendering him extensively diseased, and—except when under the direct stimulation of his drug—stupid, sottish, and extremely miserable. Alcohol, being a more rapidly diffusible and a more fiery stimulant, (§ 1549.) seems almost instantaneously to pervade the whole system, and to make a direct

assault on every part of the living body at once.—A very few drops of pure alcohol introduced into the human stomach, unaccustomed to it, will destroy life nearly as quick as prussic acid; (§ 1559.) and a small quantity of the common spirits of wine of the shops, will destroy life in a few minutes;—yet by commencing the use of it in a very diluted form and in small quantities, and gradually increasing the strength and quantity, the human body, we know from most melancholy fact, may, through physiological depravity, (§ 1542.) be so accustomed to this deadly poison, that it will receive it in large quantities, and in some rare instances, be, as it were, saturated with it for many years, and still live on. (§ 494.1559.) Yet alcohol, whether in the form of distilled liquors, or fermented,—whether in wine or beer or cider, *is always an anti-vital principle*—always acts on the human body to disturb and impair its physiological functions, and to destroy its physiological powers. When first taken into the stomach, it highly inflames that organ, and by the strong vital reaction, is expelled from the gastric cavity into the small intestine, and extends its inflammation through the whole length of that canal. It has been supposed to promote digestion, and has formerly been prescribed to dyspeptics, by physicians generally; but it is now a matter of perfect certainty that it always retards chymification (§ 1388.) and renders the process less perfect; and always diminishes the functional power of the stomach:—in short, its effect is always, and in the nature of things, of necessity, to destroy the vital properties and the vital constitution of the tissues of the body; (§ 1561.)—and always to disturb every vital function, to deteriorate every functional result, and to impair and destroy every physiological and psychological power of the human system. It cannot therefore, be

used as a stimulant in any quantity, without some degree of injury to the whole nature of man; and when habitually and freely used, it always does great mischief, and almost inevitably, leads to the most ruinous consequences, in body and mind: and nothing but the blindest infatuation, growing out of sensual depravity, (§ 586.) could induce human beings to cling to, and vindicate the use of such a destructive poison, as a means of stimulation. (§ 1560.)

Tea and Coffee.

§ 1563. But probably the most general, and unbroken, and I might almost add, the most mischievous delusion of the civilized world at the present day, in relation to intoxicating substances, is that which leads to the nearly universal use of tea and coffee, as common beverages, by male and female—old and young—vigorous and feeble—healthy and sickly—rich and poor,—by all habitually as articles of diet, and by most, excessively, as means of intoxicating exhilaration.—The other poisons of which I have spoken, (§ 1559.—1562.) have produced such manifest effects of evil, in the general experience and history of the human family, that multitudes have been convinced of their deleterious character.—But with a very few individual exceptions, there is a universal belief in all parts of the world, where tea and coffee are used as beverages, that they are not only perfectly innoxious, but positively salutary.—The fundamental principles on which this delusion rests, have already been explained, (§ 1539. *et seq.*)—viz.—1st, the physiological capability of the human body to adapt itself by depravity, so perfectly to the action of the most baneful substances, that it will manifest no immediate symptoms of the poisonous

effects of such substances:—2d, the stimulation produced by even the most deadly poisons, to which the system is accustomed, is identified in the mental consciousness, (§ 1543.) with the natural and healthy physiological stimulation of the body, and is enjoyed in proportion to the physiological depression which it removes, and the agreeable exhilaration which it causes:—3d, the use of tea and coffee, is commenced at so early a period in life,—they are at first used in such small quantities, and so gradually increased, and the physiological powers of the body are depraved by such imperceptible degrees, that those violent and distressing symptoms which indicate the immediate action of a powerful poison, very rarely, if ever result from the habitual use of these substances. (§ 880.) The consequence is that, the depraved appetite which they create,—the physiological depression and demand for stimulation which they cause, and the grateful exhilaration which they produce, make all who use them, love them in proportion to the freedom with which they are used, and with equal confidence, believe that they are perfectly salutary cordials, and indispensably necessary to comfort and to health.—But, if instead of commencing the use of these substances in very small quantities, a full cup of strong tea or coffee were taken at the first time, either by a youth, or a full-grown person, of a healthy and undrugged body, the violent and distressing symptoms which would inevitably result, in every case, would leave no doubt of the poisonous character of these substances.—For there is no truth in science more fully ascertained, than that both tea and coffee are among the most powerful poisons of the vegetable kingdom.—As early as 1767, Dr. Smith, of Edinburgh, demonstrated by a series of careful experiments, that an infusion of green tea had the same effect as henbane,

tobacco, cicuta, &c., on the living tissues of the animal body; (§ 1561.) in all cases, first diminishing and finally destroying their vital properties. In 1772, Dr. Lettsom, of Ireland, made a series of similar experiments with the same results:—and still later, Dr. Beddoes, of England, by a series of experiments several times repeated, completely demonstrated that tea is as powerfully destructive to life, as laurel water, opium or digitalis.—Indeed, it is entirely certain that a small quantity of a strong decoction of tea or coffee will destroy human life, in one unaccustomed to the use of them, as quickly as an equal quantity of laudanum.

§ 1564. A notion has prevailed quite extensively, that green tea is more hurtful than black, on account of the former's being cured on copper: but this is wholly incorrect.—Green and black teas are varieties of the same plant; and the only reason why green tea is a somewhat more active and powerful poison than black, is that its natural properties are less impaired by the process of curing.*—We are informed however, that since 1832, a large proportion of the green tea imported into the United States, has been manufactured from damaged black tea, by a process in which a small quantity of prussian blue is used:—yet with this addition, the tea thus manufactured, is not more poisonous than the genuine green tea of the best quality.—But in regard to tea and coffee, as of all other intoxicating substances, which human beings use as means of habitual stimulation, there is a blind determination on the part of those who thus employ them, to defend their character, and to ascribe whatever evils may seem to be connected with their use, to something besides

* Mr. Brande, the distinguished analytical chemist, of England, by a series of careful experiments made in 1821, proved that there is no appreciable difference between green and black teas.

the intrinsic properties of the substances themselves.— Yet, considering how early in life tea and coffee are introduced into the diet of children, and how universally and freely they are used, by both sexes of every age, it is greatly to be doubted, whether they are not at present, actually doing more injury to the human constitution, and in a greater measure destroying human health, life and happiness, than any other intoxicating substance used in Christendom.*—Besides the injury done to the body by the very high temperature in which they are usually drunk, (§ 1321.) their strong narcotic property—in proportion to the freedom with which they are used,—has the same deleterious effect as tobacco, opium and alcohol (§ 1541. 1562.)—impairing, and serving to destroy all the physiological and psychological powers of the human system.—The appreciable morbid effects which they produce are of course, modified by the different degrees of constitutional power in different individuals, (§ 668.) and by all the varieties of situations, circumstances, conditions, and habits in life:—but in all cases, they impair the functional powers of all the assimilating, circulating, and other organs concerned in the general office of nutrition,—cause more or less of unhealthy irritability in the nerves of organic life,—debilitate the brain and the whole cerebro-spinal system, (§ 228.)—diminish the muscular power,—in every respect, predispose the body to disease,—always aggravate disease when induced,—cause frequent and distressing physiological depression, and mental disquietude and despondency, and strongly tend to delirium and confirmed insanity.†—The feeble and the sedentary

* There are now more than ten millions of pounds of tea, and fifty millions of pounds of coffee consumed in the United States annually, and the quantity is rapidly increasing.

† Tea and coffee will produce *delirium tremens* quite as quickly as ardent spirit, if they are used to the same excess.

suffer more from the effects of tea and coffee, than the vigorous and the active; and, as a general statement, woman, more than man:—indeed, the sufferings of woman are very greatly multiplied and enhanced by these treacherous beverages, which she regards as indispensable to her comfort.

§1565. It is most evident then, that tea, coffee, tobacco, opium, alcohol, and all other, narcotic and intoxicating substances, are poisonous to the human body, and cannot be employed by man, as means of stimulation, without decided detriment to his whole nature; and when they are habitually and freely used, the injury is always great and often very calamitous.—Besides the evils already mentioned, the habitual use of narcotics, serves powerfully to diminish the size of the human body from generation to generation, and otherwise to impair its symmetry, (§ 973.) and greatly to deform it. (§ 972.)—Employed as medicine, these substances often do great mischief; and it is certain that as a general fact, the medical use of them has been incalculably more injurious than beneficial to the human family.—In short, as a general rule, the less man has to do with them, as stimulants or as medicine, the better will be his health, and the more uniform his enjoyment:—and the less he has to do with all kinds of purely stimulating substances, as seasonings to his food, or means of stimulation, the more certainly will he be blessed with good health, long life and happiness, if his habits are in other respects correct.—Even the camphor and the cologne bottles are far more frequently the sources of evil than of good to those who employ them: and the infusions or teas made of pungent and exciting herbs, should be used with great caution;—and especially, as drinks or medicine for children.—Both for internal and external application,—

in health and in sickness, pure water is, as a general rule, the most salutary liquid that can be used. (§ 1526.)

LECTURE XXIV.

SLEEP—The physiological necessity for sleep—The restorative effects of sleep—Causes of unsound sleep, and of dreams, somnambulism, &c.—Dreaming not compatible with the most refreshing sleep—How far physiology determines our hours of sleeping—Sleep, in relation to longevity—Neither too much nor too little sleep, consistent with sound health—Vegetable-eaters can do with less sleep than flesh-eaters—Sleep of children—Improper means to cause children to sleep—Sleep of aged people—The proper time of sleeping—How much time required for sleep—BEDS and bedding—Feather-beds objectionable—why?—Hard beds best—Best kinds of bed clothing—Bed-rooms should be large—Night garments—Entire change of clothing at night—Night and day clothes should be aired—Bed rooms, and every thing in them should be kept clean—Beds, &c. of children and aged people—Ventilation of bed rooms—**BATHING**—Importance of cleanliness—Different modes of bathing, and proper times—Importance of the bath to children and aged people—Its great value as a remedial means—Shaving, cutting the hair, &c.—**AIR**—Pure air indispensable to perfect health—The physiological reasons—Causes of impure air—Great importance of pure air to children and the aged—**CLOTHING**—All clothing in itself an evil—How far necessary, and for what purpose—The proper regulation of clothing—**EXERCISE**—Its indispensable importance to health—Different kinds of exercise adapted to civic life—Great efficacy of proper exercise as a remedial means, for the feeble—Its great importance to the young and the aged—General conclusions and remarks.

§ 1566. HAVING fully ascertained the natural dietetic character of man, and pointed out the general rules which should govern him in his dietetic habits, we are next led to consider what regulations are necessary in regard to sleeping, bathing, air, clothing, and exercise.

§ 1567. We have seen (§ 121.—137. 207. 208. 314.) that, in many of its properties and functions, the human body resembles a tree or plant.—With the exception of mastication, (§426. *et seq.*) and gastric digestion or chymification, nearly or quite all the processes in the general function of nutrition, are very similar in the animal and in the plant; and hence, that system of nerves in the human body, which presides over the general function of nutrition, is called the system of vegetative or organic life, (§ 218.—228.) and all those organs which are immediately concerned in this general function, are said to belong to the domain of organic life, and in health, perform their particular functions without the volition (§ 302. 303.) and without the consciousness of the animal. (§ 294.) But the food of the animal, being separated from it, and requiring perceptive, and locomotive, and prehensive, and voluntary powers, in order to furnish the digestive organs with the necessary supply of aliment, (§ 209.) it is provided with organs of external relation, adapted in anatomical structure and physiological endowments, to the properties of external things and to the internal wants of the organic system. (§ 210. 316.) These organs of external relation in man, (§ 698.) consist of the brain and spinal marrow with all their nervous cords, branches, fibres and filaments; and of the various muscles of voluntary motion, together with the bones, cartilages, ligaments, tendons, &c. connected with those muscles and acted on, and moved by them. (§ 233.) We have seen also, (§ 885.) that the performance of every function in the living body, is attended with some expenditure of the vital properties and organized substances of the organs which perform them: and that it is the constant business of the general function of nutrition to replenish and repair the exhaustion and waste thus produced. (§ 393. 503.)

§ 1568. In the domain of organic life, God has wisely and benevolently, so ordered things that the replenishing and repairing economy of the system—as a general fact—keep pace with the expenditure of power and waste of substance in the performance of the vital functions, (§ 376. 377.) so that, the heart, with only the momentary rest which one part enjoys while another is in action, as the ventricles and auricles alternately contract, (§ 372.) is able to continue its operations, without interruption, from the commencement of our being, to the termination of our earthly existence;—and the lungs, with only the brief repose which follows each expiration, (§ 479.) are able to continue on their exercise incessantly through life: and all the other organs of involuntary motion, and vegetative function, are sustained in the constant performance of their duties in the vital economy of the system, with no other rest, while the body exists, than the very short repose which may intervene between the regular performance of their functions, (§ 1442.) or their regular actions. But in the domain of phrenic, or animal life, (§ 229.) where action is voluntary, the same balance between the exhausting and replenishing economy, is not kept up. (§ 377.)—In the contraction of every voluntary muscle, in the exercise of every nerve belonging to this domain, the expenditure of vital power and waste of substance, as a general fact, somewhat exceed the immediate replenishment and repair effected by the general function of nutrition; (§ 503.) this excess, we have seen, (§ 919.) is greater in the flesh-eater than in those who subsist on a pure vegetable diet, and still greater in those who use pure stimulants with their food, (§ 1556.) and far the greatest in those who act under the influence of intoxicating substances. (§ 1559.) But, even in those of the purest and simplest habits, whose diet and general regi-

men are the most perfectly adapted to the physiological and psychological interests of human nature, the continued exercise of any voluntary organ, or of any part within the exclusive domain of animal life, always causes an expenditure of vital power and waste of organized substance, which in some measure exceeds the immediate replenishment and repair effected by the general function of nutrition; and when that exercise is severe and long continued, the excess is very considerable, causing a sense of weariness, and sometimes of distress.—And as the brain and the organs of special sense (§ 396. *et seq.*) and the nerves of animal life generally, (§ 228. 232.—307.) are continually exercised in the operations of the mind, and the voluntary motions of the body, they largely share in the general exhaustion and weariness of the domain.

§ 1569. It is evident therefore, that if the exercise of the organs in the domain of animal life, were to be continued too long without interruption and repose, their exhaustion would become so great as completely to destroy their functional powers, and throw the organs into a state of painful and ruinous disease.—Regular periods of rest are therefore, indispensably necessary to the health and functional integrity of all these organs and parts:—and our benevolent Creator has wisely ordained such periods of rest, and placed those organs whose unceasing functions are essential to our bodily existence, so entirely independent of the powers of animal life, (§ 302. 303.) that these latter may be hushed in death-like repose for several hours in succession without the least interruption to the action of the former. (§ 577.)

§ 1570. SLEEP then, is the repose of the organs of animal life, in order to afford the vital economy an opportunity to replenish and repair the exhaustion and

waste and injury which they have sustained from previous exercise, and perhaps abuse. (§ 1429.)—How beautifully therefore, is man in this respect, adapted to the natural world in which he lives.—While light surrounds him, he has organs adapted to perceive it, and by its aid, to perceive the visual properties of things: (§ 699. *et seq.*) —and while, with this advantage, he is able to direct his course whithersoever he may choose, and to whatever object he may desire, he has organs adapted to the audible and olfactory, and gustatory and tangible properties of things by which he can hear and smell and taste and touch, (§ 294. 566.)—and he has powers (§ 530. *et seq.*) by which he can think, reflect, and reason and judge and *will* and act, and thus fulfil the functions and the final causes of his organs of external relation, and supply the wants of the internal domain. (§ 233.)—But, when the light fades away, and darkness gathers round him like the pall of death, (§ 18.) his vision is blotted out, and he no longer needs the exercise of any of his special senses,—nor of any of the powers of animal life; and when these all naturally require repose, then nature, with a bland and soothing influence, gently seals up his senses, and draws the shroud of oblivion over his consciousness, and leaves him to rest in the temporary death of all his moral and intellectual and voluntary powers (§ 581.)—while the vital economy over which the nerves of organic life preside, (§ 283.) unceasingly and industriously carries forward its replenishing and repairing and renovating operations;—in order that he may wake as by a resurrection to a new existence, refreshed and vigorous, and full of health and happiness in every part.

§ 1571. O, man knows not, nor ever dreams how constantly the goodness of his Creator, is acting to

redeem him from the effects of his transgressions!—how, when the day is spent in continual abuses of his body—in the habitual violation of the laws of life,—and when night comes and he is lost in sleep, and ceases from his sins, the hand of God in unremitting kindness and parental mercy, directs and urges on those renovating processes of the vital powers, (§ 1429.) by which the injuries his system has received, from his pernicious practices, are so nearly repaired, that, when he awakes and rises to another day, and feels as fresh and vigorous as at yester-morn, he *will not* believe that the tobacco and alcohol and other poisonous and improper substances which he indulged in yesterday, did him any harm:—and thus, for the benevolence of God, who watches over him with unceasing care, and by every means which can be brought to act upon his moral susceptibilities, endeavors to reclaim him from his sins, he only returns that strange perverseness which, in disobeying God, destroys himself.

§ 1572. In a perfectly healthy and undepraved state of the system, sleep is, as it always should be, an entire suspension of all the powers of animal life; (§ 577.) every sense is completely locked up, every thought is hushed and not the slightest consciousness of existence remains:—and in such a state of the system, this death-like sleep is so profound, that it is not easily disturbed by any external cause. But when continued errors of diet and other infractions of the laws of life (§ 693. *et seq.*) have considerably impaired the healthy properties of the nervous system, and especially the nerves of organic life, and produced in them an increased irritability approaching to, or actually possessing a morbid character, (§ 297. *et seq.*) sleep becomes less death-like in its profoundness, and is more easily broken by external causes, and almost continually disturbed by internal

irritations.—While Caspar Hauser (§ 1141.) continued to subsist exclusively on his simple vegetable food and water, and to sleep on his bed of straw, “his sleep,” says his biographer, “was sound and dreamless, and it was extremely difficult to wake him:—and it was not till after he went to live with Professor Daumer, and was furnished with a proper bed,” continues the learned writer, “that he began to have dreams.” This statement naturally leads to the inference that the change from the bed of straw to the “*proper bed*” was the principal cause of Caspar’s sleeping less soundly and of his dreaming. But no one, being acquainted with correct physiological and psychological principles, can for a moment give credit to such a notion. If by a “*proper bed*” the writer means a bed of feathers and a great abundance of warm clothing, it is undoubtedly true that such a bed served to debilitate his system and to diminish his physiological powers, and in some measure, obstruct the freedom of pulmonary and cutaneous respiration, (§ 516.) and thus, to increase the injurious effects of other causes; but, sleeping on a proper bed, could have no direct tendency to make him dream. It is, beyond all question, certain that the chief, if not the exclusive cause of Caspar’s sleep becoming less sound, and of his dreaming, was the irritation produced in the domain of organic life by the change in his dietetic habits, and sympathetically involving the brain. (§ 299. 577.)

§ 1573. When there has been so intense and so protracted an over-action of the brain, or of any part of it, as to destroy the healthy condition of the part, and induce in it a highly morbid irritability, then such a state of cerebral disease may be the immediate cause of dreaming:—yet this state, as a general fact, cannot take place without deeply involving the condition of the nerves of organic

life, in the stomach, and to some extent, throughout the whole domain, (§ 596.) so as to produce a morbid reaction on the cerebral part, either as an exciting or an aggravating cause of dreams. (§ 305.) Again, if there has been such an exercise of the brain, by the continued action of the mind on some particular subject, as to produce great cerebral exhaustion or weariness, without actually inducing morbid condition, irritation in the domain of organic life, will be exceedingly apt to cause dreams on the same subject, on which the mind has been employed in the waking hours. (§ 1206.) But, in all cases, when there is no irritation in the domain of organic life, cerebral exercise, which stops short of inducing morbid condition, instead of being, in any degree, a cause of dreaming, is, on the contrary, a most powerful final cause of the more profound and dreamless sleep:—and even when there is actually a morbid state of any part or parts of the brain, there will seldom if ever be dreams, without irritation in the domain of organic life. (§ 218. *et seq.*)

§ 1574. Irritation in the domain of organic life therefore, (§ 581.) may be considered the grand cause of unsoundness of sleep and of dreams, in all their varieties, from the most shadowy and vague conceptions of things, to the most strongly marked and extraordinary cases of somnambulism:—and it will always be found that the removal of this irritation, is the most certain and speedy way of preventing such effects. The principles upon which this irritation produces dreams, I have fully explained when treating on the functions of the brain; (§ 560. *et seq.*) and it is not necessary that I should repeat them here. The alimentary canal, including the stomach and intestinal tube, is the ordinary seat of this irritation: (§ 577.) but the liver, kidneys, and indeed, each particular organ in the domain of organic life, may be the special seat of

it. (§ 299.) Nevertheless, even in cases of this kind, the originating causes are, generally, such as act on the alimentary canal, and induce a morbid condition of particular organs by continued sympathetic irritation. (§ 521.)

§ 1575. It may therefore, be asserted as a general fact, that dietetic errors are the originating, and generally the immediate causes of unsoundness of sleep and of dreaming in all its varieties. (§ 577.) Many other causes co-operate with these, to aggravate their effects, and render sleep less refreshing; which however, would, of themselves, seldom, if ever, cause dreaming:—and it should be remembered that *dreaming is always to be considered as unfavorable to the welfare of the human system*, inasmuch as it is a demonstration of some disturbance in the system, causing unsoundness of sleep, and some degree of action in the brain, when its repose should be perfect.

§ 1576. To enumerate particularly all the dietetic errors, by which the soundness of sleep is impaired and dreaming, in all its varieties, is caused, would be to repeat much that I have said in the preceding lectures. It is sufficient therefore, to say that every violation, in our dietetic habits, of the laws of constitution and relation established in our nature, (§ 693. *et seq.*) tends to produce these effects:—or in other words, every thing in the quality, quantity and condition of those substances that we use for nourishment, drink or stimulation, which irritates the stomach and intestines, and increases the irritability of the nervous system, serves to render sleep less sound and refreshing, and tends to excite dreams. All alcoholic and narcotic substances, all pure stimulants, (§ 1212.) all improper culinary preparations of food, all improper concentrations and combinations of alimentary substances, (§ 1320. *et seq.*) imperfect mastication, too

rapid deglutition or swallowing, eating too much, eating at improper times, &c., &c. (§ 1444.) are among the most prominent causes which impair the soundness of sleep, and excite every variety of dreams. Lewd and licentious habits of every kind, by producing similar effects on the nervous system, serve also, in the most powerful manner to impair the soundness of sleep and to increase the liability to dreams. Yet I have found that, in bodies much disordered by these last named causes, dreams may generally, if not always, be prevented by strictly avoiding dietetic errors, and shunning every thing which will produce irritation in the alimentary canal.

§ 1577. The sleep of young infants and of children generally, is much impaired by over-feeding, and other dietetic errors; (§ 1463. *et seq.*) and the evil habit of stuffing them full just before they are put to sleep, and of nursing them frequently during the night, is by no means the least of those errors.—As a general rule, the digestive organs of human beings, and most especially in civic life, should have little to do, during the hours of sleep: (§ 1454)—and this applies to people of all ages and circumstances, and particularly to the young and old, and feeble and infirm. And hence, it were unquestionably better for every one in civic life, as a general rule, to take no food nearer than four, or at the shortest, three hours before retiring to rest: (§ 1450.) and as a general rule, also, every one, diseased or well, should avoid sleeping immediately after a meal, in the daytime:—for, though this habit may not seem to be immediately attended with injurious effects, yet it is most certain that such effects do result sooner or later—in some form or other. (§ 1453.) Gentle and pleasant exercise, and cheerful conversation, and innocent amusement are infinitely better after a full meal than sluggish rest, or sleeping. (§ 1511.)

§ 1578. As I have stated (§ 1422 *et seq.*) concerning the times of eating, so I must say in regard to sleeping, physiology does not determinately point out the precise hours at which we should go to sleep, and at which we should arise,—nor tell us exactly how long our sleep should be. Yet without doubt, if man were, in all respects, perfectly obedient to the laws of constitution and relation established in his nature, the instinctive, physiological powers of his system, would regularly lay him down to sleep, and rouse him up again, at stated hours, with all the punctuality of undisturbed physiological habitude. (§ 1428.)

§ 1579. It is an interesting fact that, Caspar Hauser, for some time after he was set at liberty, “regularly commenced and ended his sleep with the setting and the rising sun.”—And when it is considered how long he was confined in his dark dungeon, where day and night were alike to him; and where the perfect simplicity and uniformity of his habits and circumstances, were all peculiarly adapted to favor those physiological habitudes which naturally belong to the undisturbed economy of the vital domain, this fact seems to be the most distinct and unequivocal testimony of nature, on this point, that has ever been afforded us, or of which we have any knowledge. It is true, we have been accustomed to think that man requires less sleep than this fact would seem to justify; and it is probably also true that, we have not properly appreciated the importance of perfectly sound sleep, as one of the principal means in the economy of nature by which health is preserved, and still more, by which life is prolonged. Certain it is however, that, as a general rule, men who have been most remarkable for their extraordinary longevity, have been long and sound sleepers.

§ 1580. But sleep, to be most favorable to health

and longevity, must be perfectly natural and sound:—the broken, dreamy sleep which is too generally experienced by members of civic life, is better than none, but far from being best. Nor is it, by any means, compatible with health or length of life, for any one to endeavor to prolong his rest in bed, a greater length of time, than he can sleep with tolerable soundness. A sluggish drowsiness too long continued always serves to debilitate the system,—to relax the solids,—impair the functional powers of the organs, and to produce general languor and stupidity. While on the other hand, excessive wakefulness, or too little sleep, causes excessive exhaustion of the vital energies, particularly in the domain of animal life (§ 228.)—debilitates the brain and all the organs of the special senses, and impairs their functional powers, relaxes the muscles, and finally debilitates the whole system, and abbreviates the period of life. And, if sleep is too long prevented, derangement of the mind, and of the general functions of the system, and death speedily ensue.

§ 1581. It is important to remark that those who temperately subsist on a pure diet of vegetable food and water, can endure protracted wakefulness much longer without serious injury, than those who subsist principally on animal food; and those who freely use stimulating condiments with their food, are still less able to bear continued watchfulness; and those who freely use intoxicating substances will suffer the soonest and most of all from this cause. (§ 1559. *et seq.*).

Sleep of Children and Aged People.

§ 1582. Young children require more sleep than adults, or youth;—but all artificial means of protracting

their sleep, are decidedly objectionable, and many of them, exceedingly injurious.—If the quality and quantity of their food (§ 1501. *et seq.*) and their times of receiving nourishment, (§ 1463. *et seq.*) are properly regulated, and if they are correctly managed in other respects, they will require no cradle to secure their sleep, and still less, will they require opiates of any kind, either through the mother, (§ 1304.) or administered directly to themselves. As a general fact, rocking children in a cradle, has a bad effect upon their health; and none but the most gentle motion of this kind, should ever be allowed;—and the habit of mothers and nurses, of drinking gin or brandy toddy or porter or ale or any other alcoholic or narcotic liquor,* or of giving any of these, or any paregorics or carminatives to children, to make them quiet and to cause them to sleep, is exceedingly bad—not to say very wicked and cruel. Well managed children will sleep full as much as the good of their little bodies requires without the use of any such means, and it is infinitely better that they should occasionally cry and exercise their lungs, than that they should be kept continually in a state of sluggish quietness by stupifying and deleterious substances. Even the herb teas of domestic preparation (§ 1565.) should be used with great caution and very sparingly. If nursing children are restive and fretful, examine their dietetic habits, and the dietetic habits of the mothers or nurses; and the cause may generally, be very readily found. It is more cruel than the grave, for the mother or nurse to be constantly indulging in those kinds of food and drink which inevitably produce irritation in the delicate little bodies of children, (§ 1304.) and then to endeavor to allay that irri-

* Many a nursing infant has been intoxicated and stupified by the substances swallowed by the mothers. (§ 1304.)

tation by anodynes.—It will be almost a miracle if such children do not either die before they get through teething, or become afflicted with chronic disease before they are twenty years old. I repeat then, that no artificial means should be used to cause children to sleep; and the utmost care should be taken to avoid every thing relating to their diet, clothing cleanliness, &c. which may serve to impair or abridge the natural soundness and duration of their sleep. A great want of cleanliness of their bodies is exceedingly unfavorable to the sound and healthful sleep of children.

§ 1583. Old people require less sleep than the young and growing, and less than the middle aged. (§ 1506.) But it is of great importance that the sleep of the aged, should be as sound and as long, as it can possibly be rendered by *natural and proper means*: (§ 1579.) and it is perfectly certain that where such means are strictly observed, their sleep will be much more sound, refreshing and protracted than is ordinarily enjoyed by those who are advanced in years.

The proper Time and Duration of Sleep.

§ 1584. Some have contended that it is of little importance whether we sleep in the night or in the daytime, so that we sleep a proper length of time. But every indication of nature, and all experience are opposed to such a notion; and to a properly enlightened mind, there cannot be the least ground of doubt that the night is the natural time to sleep: (§ 1570)—that is, in all parts of the globe where the twenty-four hours are regularly divided into day and night. (§ 18.) And all experience in civilized life, has proved also, that,—other things being equal—those who get a considerable portion of their

sleep before midnight are, as a general fact, the most healthy and long-lived. In that state, which, in all respects, is most perfectly adapted to the constitutional nature of man therefore, (§ 654.) there is every reason to believe that he would retire to rest soon after daylight disappears in the evening, and rise with the first gleam of light in the morning. But in the present artificial state of civic life, there are so many things to disturb and break up the natural physiological habitudes of the human system, (§ 1428.) that even the sleep of man is exceedingly affected by circumstances: so that, it is impossible to lay down a general rule which will be equally suited to every individual. The best *general rule* therefore, which I can lay down for all people in our climate, and indeed in all climates where the day and night are nearly of the same length as ours, is that, they should retire to rest as soon as they can after daylight disappears and rise as soon as their sound and refreshing sleep is at an end; and certainly, as soon as the earliest dawn of the morning appears. But, if mankind will not listen to this general rule, which is undoubtedly the best that can be given to them, then I will give them another which is an extreme concession to human perverseness of habit; and say that as a general rule, the *very latest hour* at which any human being should be kept from sleep, is ten o'clock at night, and none should be in bed after the sun is risen.—We have been told of individuals who habitually took but four hours sleep: and undoubtedly some, by virtue of good habits in other respects, or a powerful constitution, may hold out many years in this way; but it always and inevitably shortens life, by an undue expenditure of the vital energies of the constitution in maintaining the animal and sensorial powers and functions.—Six hours are probably the shortest time that man can

habitually devote to sleep, consistently with the permanent welfare of his system: and perhaps, eight hours of sound sleep, are as many as any one can secure or enjoy to advantage in the present state of things. An average of seven hours therefore, is probably the nearest we can come to exactness in a general rule for man in civic life.

Beds, Bed-clothes, Bedrooms, &c.

§ 1585. Concerning beds, I cannot speak the whole truth without greatly reprobating a strongly cherished custom of society, for, I am compelled to declare that *feather-beds* are in every respect objectionable; and that they possess not one redeeming quality—not a solitary virtue to save them from the general bonfire to which they ought immediately to be consigned.

§ 1586. Is it claimed that they are “soft and warm,” and therefore conducive to human comfort?—It is true that feather-beds are absolutely softer than straw, hay, moss or hair mattresses:—and it is true that they do not so rapidly conduct the heat from our bodies, and therefore, are considered warmer:—but it is also true, that they so relax and debilitate our bodies, and so affect our nervous systems and our calorific function, (§ 499.) that we *feel* our feather-beds to be harder, and to be less conducive to the healthy and comfortable regulation of our bodily temperature, than our beds of straw or moss. And hence, when we become fully accustomed to hard beds, if our habits are in other respects correct, we do not require so much clothing, by night nor by day, in cold weather as when we are accustomed to sleep on feathers.

§ 1587. We have seen (§ 287.—299. 330. 337.) that there are the most intimate and important anato-

inical connexions and functional and sympathetic relations, between the external skin of the body and the mucous membrane which lines the alimentary and respiratory cavities, &c., (§ 338. 353.) and that through these and other media, the external skin holds very direct and powerful relations with all the internal organs and functions of the system.—In consequence of these relations, (§ 697.) feather-beds, not only relax and debilitate the external skin and impair all its functional powers, and make it more susceptible to cold and to all the changes of weather, (§ 500.) and to the action of all insalubrious causes and influences, but they also relax and debilitate the whole system, and serve to impair every one of its physiological powers and interests. (§ 299.)—The lungs and digestive organs are powerfully affected by every thing which is detrimental to the general condition of the external skin. (§ 291.) So that, by habitually sleeping on feather-beds, we are more predisposed to dyspepsy, with all its train of evils, and to pulmonary diseases of every description.—Indeed, there is probably not a single disease, with which the human system has ever been afflicted, that we are not more strongly predisposed to, and which, when actually existing, is not in some measure, aggravated by the use of feather-beds. I repeat therefore, that they have not one redeeming quality, and ought, with as little delay as possible, to be utterly and forever discarded, by every human being. They cause many more evils than it is convenient or even proper for me to enumerate on this occasion; while, on the other hand, they do not, in reality, minister to the comfort of mankind in any manner.

§ 1588. We have seen (§ 516.) that the whole external skin of the human body, is in some measure, a breathing organ, and that it is continually exhaling a vapor,

loaded with various excrementitious matters, and held in an aeriform state by the heat which passes with it from the body. (§ 129. 130.—Feathers being non-conductors, not only retain much of this heat about the surface of the body, but also, retain so much of the gaseous and other perspired substances as to keep the body surrounded by a very impure atmosphere, while in bed. This impure atmosphere penetrates into every part of the bed:—and besides this, there is always more or less of dead animal matter belonging to the feathers, which is continually undergoing decomposition, and forming unwholesome gases and offensive odors. So that, a feather-bed—if the utmost pains are not taken to prevent it—soon becomes so completely saturated with its own impurities and those received from the human body, that it will give to the whole room, and even to the whole house, a very disagreeable and unhealthy odor:—and when the bedroom is small, and not well ventilated, nor properly cleansed, the very walls become, in a few months, so deeply tainted with the impurities, that it is almost impossible, by repeated cleansing and whitewashing, to destroy the offensive smell, even in years.—And where every measure is taken to keep a bedroom clean and sweet, if it contains a feather-bed, it will always have a disagreeable smell, to those who have a pure olfactory sense.—In every respect therefore, feather-beds are unworthy of a place in the habitations of civilized beings.

§ 1589. Mattresses made of hair, if the hair has been thoroughly cleansed, are incomparably more favorable to health and purity and comfort than feather-beds.—Mattresses made of moss, Manilla grass, husks, straw, hay, palm-leaf, &c. are still more conducive to the highest and most permanent well-being of the human body.—For it should ever be remembered that, always and of neces-

sity, in proportion as we, by the artificial means and circumstances of civic life, bring our bodies into that condition which renders soft beds indispensable to our immediate comfort, we diminish our physiological powers, —increase the uncertainty of health, and abbreviate the duration of life; and the evil is always increased by an indulgence in the thing for which we thus create a demand. (§ 735. 1317.) Bodily development, symmetry, (§ 947.) vivacity, agility and vigor, and mental cheerfulness, activity, clearness and power, and moral purity and elevation and happiness, are all best promoted by a hard bed.

§ 1590. It is of much importance that the clothes of the bed should be properly regulated as to quantity and quality.—Too many bed-clothes render sleep less sound and refreshing; and serve to relax and debilitate the body; and in every respect, to impair the physiological powers of the system; while on the other hand, the want of sufficient clothing, in cold nights, by suffering too great an abstraction of animal heat from the surface of the body, (§ 499. 501.) impairs the soundness of sleep, and renders it much less refreshing and invigorating: and where the want is great and continued, the evil consequences are often very serious.—Be it remembered however, that all my remarks concerning beds, bed-clothes, &c. are made with reference to man as a member of civic life, and as an inhabitant of a climate which renders the use of artificial means necessary for the proper regulation of the temperature of his body.—For undoubtedly, if clothing were not necessary for the regulation of the temperature of the body, sleep would be more perfect and refreshing and invigorating without any, than with it. (§ 730.)

§ 1591. There is a kind of bed-clothing becoming very common in our country, which ought never to be

used except from necessity, where other kinds cannot be had:—I mean those articles made principally of cotton-battening or wadding, and called *comfortables*;—a very great misnomer; for they are, in reality, very *uncomfortable* things.—They have much the same effect on the body that feather-beds do; (§ 1587.)—relaxing and debilitating the whole system.—Indeed, people in delicate health, can generally, soon tell by their *feelings*, when they are lying under one of these articles;—for they render respiration less free, and cause a general sense of oppression and weariness, which often amounts to a painful sense of lassitude; and hence, as a general fact, sleep is less sound and refreshing and more disturbed by unpleasant dreams when this kind of clothing is used.—Woollen blankets are incomparably better articles of clothing for beds than such *uncomfortable comfortables*:—for, while blankets are sufficiently non-conducters to retain the heat, they are not so utterly impervious to the air, and to the exhalations of the body, yet, for reasons which I shall give when I come to speak of bodily garments, it is better, as a general rule, that the woollen bed-clothing should not come in immediate contact with the skin.—In cold weather, cotton sheets are probably the best that can be used; and in hot weather linen sheets are preferable.

§ 1592. From what I have said, (§ 288. 289. 331. 516. 1588.) concerning the functions of the external skin, it must be evident that an impure atmosphere is continually formed around the surface of the body, while we are in bed and enveloped in clothes, which completely prevent any thing like a current of air, or the atmospheric motion which, during the day, is constantly produced by our voluntary action and other causes.—This impure atmosphere, as I have stated, (§ 1588.) penetrates into

the bed and into all the bed-clothes; and, as it were, completely saturates them.—If we go from the fresh morning air, into a sleeping-room, at the moment when an individual is rising, we shall have a very strong olfactory perception of the impurities which issue from the bed;—and if that bed be soon made, without airing, and the room be not freely ventilated, the very walls of the room, as we have seen, will, in a short time, become strongly and deeply tainted with the offensive and unwholesome odor.

§ 1593. When we rise in the morning therefore, the bed should be thrown open, and as soon as may be, the bed-clothes should all be taken off and thrown over clothes-horses or chairs, and the bed shaken up, and the windows opened; so that, the whole may be thoroughly aired before the bed is made:—and they who persist in using feather-beds, should very frequently lay them out in the open air and hot sun, that the impurities which are constantly accumulating in them, (§ 1588.) may be fully driven off:—and it will be still better if, as often as once in four or five years, the feathers be subjected to the cleansing process of baking.

§ 1594. On retiring to rest at night, every thing worn during the day, should be taken off, and hung up on pegs, on clothes-horses or on the backs of chairs, or elsewhere, so that, they can be well aired during the night, and give off the impurities they have received from our bodies in the daytime.—*Not a single article of clothing worn by day, should be kept on during the night:*—but flannels, and all other under clothes, should be taken off and hung up:—and, after the whole surface of the body has been briskly rubbed with a flesh-brush, a coarse towel or the hand, a loose flowing bed-garment should be put on: so that, the body and limbs shall be entirely free

from all ligatures and compressions, and there shall be nothing to prevent the most perfect freedom of respiration, circulation and voluntary motion. This bed-garment may be made of cheap cotton, and therefore, can be afforded by every one.—When this garment is taken off in the morning, it should always be hung up where it can be well aired.

§ 1595. Besides thus freely airing the bed-garment and bed-clothes every morning, they should be frequently changed and washed, that they may, by all means, be kept as clean and sweet as possible.—The bedstead should also, be kept perfectly clean in every part, and free from every impure thing, animate and inanimate.—The floor of the bedroom, should be washed frequently; and as often as twice in a year, the walls should be white-washed or cleansed with hot soap-suds. They who neglect these things, cannot reasonably expect to enjoy the best of health; nor need they be surprised if they are occasionally visited with typhus and other fevers and complaints.

§ 1596. It is exceedingly desirable that all bedrooms should be large, and so situated and constructed that they can be well ventilated, and most especially the family room, or that in which the parents and small children sleep.—Opposite opinions are entertained by different writers on hygiene, in regard to the propriety of sleeping with the bedroom windows open.—Some think it a salutary practice and others think the contrary.—One thing is certain however;—open chambers, where the house is merely clapboarded on the outside and not ceiled, nor plastered on the inside, are far more healthy bedrooms, than those which are closely ceiled or plastered.—Indeed, it should always be understood and remembered, that, both when we are sleeping and when

awake, the pure air cannot have too free an access to our whole bodies, provided we are kept sufficiently warm, and are not exposed to too strong a current. (§ 1590.)—If bedroom windows are open during the night therefore, a screen should always be placed before them, so that, the sleeper is never exposed to a current of air.—Where the bedrooms of a house open into a common hall, it is perhaps, better to open the windows of the hall and the bedroom door, than to open the windows of the sleeping-room.—It is very desirable that there should be a fireplace in every sleeping-room for the purpose of ventilation; but not for fire, except in sickness; for it is exceedingly unfavorable to health to sleep in a room where a fire is kept during the day, unless it is well ventilated before we retire to rest, and during the night.

Beds, &c. of Children and Aged People.

§ 1597. It is of very great importance that all these circumstances should be strictly attended to in relation to the sleep of children and youth.—They who desire to have the bodies of their children fully and vigorously developed,—without distortion, without disproportion,—without feebleness in any part, must not suffer them to sleep on feather-beds, nor in unclean bedding nor in confined and ill ventilated rooms. Let their beds be hard and every thing about them clean and sweet. Feather pillows should also be avoided. Pillows made of moss or fine hay or even straw are incomparably better for children than feathers. Parents need not fear that such beds will feel hard to their children. When they become accustomed to them, they will never desire softer couches, and they will sleep upon them with most

refreshing and invigorating soundness. But if their bodies are buried up in feathers every night, they will be enfeebled,—their nervous excitability will be increased,—they will be far more likely to take cold,—they will be more predisposed to diseases of the spine,—rickets, &c.—their lungs, digestive organs, and, in short, their whole systems will be debilitated and rendered more liable to become diseased. Too many children ought not to be put to sleep in the same bed nor in the same room:—nor is it well to accustom children to sleep with old people.—In strict physiological truth, it is decidedly best not only for children but for adults—for every body in civilized life, or where beds and bed-clothing are used, to sleep alone, or, but one in a bed.

§ 1598. Great care should be taken to keep the bedding and bedrooms of aged people, as clean and sweet as possible. As the vital powers of their bodies suffer an abatement of energy, it is the more important that every thing unfriendly to life should be avoided: and that every circumstance in which they are placed should be salutary. (§ 1506.)—It is desirable therefore, that for these as well as all other classes of people, the bedrooms should be large and airy.

Bathing.

§ 1599. When we consider that the whole external skin is in some measure a breathing organ, (§ 1588.)—that it is continually discharging impurities from the body, (§ 1592.)—that it is the medium through which a large proportion of the effete or worn-out matter of the system passes off, (§ 516.) and that in its anatomical structure, and functional character, it holds very near and powerful relations to the lungs, stomach and other inter-

nal organs, (§ 287.—291. 330.—337.) we must feel convinced of the great importance of preserving its healthy condition, and of securing the vigorous performance of its functions.—In order to this, few things are more indispensable than cleanliness:—and hence, bathing should never be neglected.

§ 1600. In all civilized communities, every house should be constructed with conveniences for bathing; so that, each member of the family can readily pass from the sleeping-room to the bath.—Where this has been neglected however, and such conveniences cannot readily be had, every one, even in the humblest condition of life, can easily make such arrangements as will enable him to bathe his whole body daily, with very little trouble and expense.—A portable bath may be placed in every sleeping room: and if this cannot be afforded, an ordinary wash-stand and bowl, or even a pail of water, with a good sponge or coarse towel, will answer the purpose. If to these, can be added a tub to stand in, surrounded by a screen made of cheap cotton cloth, nailed upon a frame like a clothes-horse, every thing necessary is supplied.—Pure soft water, if it can be had, should always be used for bathing and cleansing the skin.

§ 1601. On rising in the morning, the bed-garment should be laid off, and water applied very freely to the face and neck: and if the hair is short, the whole head may be plunged into the water.—A little mild soap may be used with advantage, about the face and ears and neck, to make every part perfectly clean. When thoroughly washed, these parts should be wiped dry, with a towel which is sufficiently coarse to give action to the skin. This done, if the individual has a tub or something else to stand in which will hold water, let him take a tumbler or some other vessel, and pour water freely upon his

shoulders with one hand, and with the other, wash himself briskly in every part.—This is an exceedingly great luxury, where it can be enjoyed, in every season of the year.—If however, the individual has nothing to stand in, which will keep the water from the floor or carpet, then let him take a good, large sponge or coarse towel, and make it as wet as it can be without dripping, and beginning at the back of the neck, pass briskly over the whole surface of the body and limbs; and then dip it again into the water, and wring it as dry as possible, and rub the whole surface more freely and vigorously: and then immediately take a coarse dry towel, and in a brisk manner wipe every part perfectly dry.—This operation should be followed in the same manner with a flesh-brush—as stiff as the skin can comfortably bear—applying it freely to the spine and limbs, and indeed, every part.—Where the brush cannot be had, use the coarse towel or the hand alone. If from free perspiration or any other cause, the skin is more than usually foul, a little mild soap should be applied with the sponge to the whole surface.

§ 1602. By such operations as these, the skin is cleansed and invigorated and the whole system healthfully exercised.—Those who are dyspeptic, and inclined to sluggishness and constipation of the bowels, should take this opportunity to exercise the abdomen (§ 175.) with the hands or the handle of the flesh-brush,—placing it against the lower part of the abdomen, and passing it quickly up to the stomach, and repeating the motion many times in rapid succession.—Where circumstances admit, this is also, an excellent opportunity for a free exercise of all the limbs and muscles, by leaping, swinging the arms, and throwing the body into various attitudes.

§ 1603. They who have never practised this mode of bathing, can have no just notion of the comfort which it

affords.—When, from almost any cause, one rises from his bed in the morning, languid and dull, and perhaps with a heavy feeling of the head and foul taste of the mouth, such a bath, followed by the exercise I have named, refreshes him astonishingly; and makes him feel like a new man.—Indeed, any one who has been long accustomed to this kind of bathing, would hardly be willing to dispense with it for a single morning, even to save his breakfast.—It may with perfect comfort and safety be continued through the whole year.—Even on the coldest mornings of winter it is exceedingly refreshing and grateful. After this ablution is performed, and the body is partially clothed, a tooth brush should be freely applied to the teeth with a little clean water—taking care to pass the brush over all the teeth,—both on the inner and outer side of them; so that the teeth, gums and mouth may be well cleansed.—It would be well to repeat this operation after every meal.

§ 1604. Besides the sponge bathing, there are various other modes of bathing or ablution which may be very advantageously used, under proper circumstances. The cold shower bath is exceedingly invigorating to every one who is able to bear it, and is greatly beneficial to most dyspeptics, and others who are laboring under chronic debility not connected with organic disease. Those who are much debilitated from excesses in sensuality are generally very much benefited by this bath. There is perhaps no better time for the shower bath, than immediately after rising in the morning:—and in some cases it is highly useful to repeat this bath as a remedial means, just before going to bed at night.

§ 1605. The tepid bath, varying from eighty to ninety-five degrees, Fah., according to the age, vigor, &c. of those who use it, may, under proper regulations, be em-

ployed with great advantage, by all classes of people. The robust and active, when fatigued and exhausted with the toils of the day, will find the tepid bath exceedingly refreshing. The feeble and infirm and those who are laboring under chronic diseases, such as pulmonary consumption, &c. are also much refreshed and benefited by the proper use of the tepid bath; and the frequent use of it by aged people, is highly salutary. The diseased, the feeble and the old will probably find the best time for taking the tepid bath, to be about eleven o'clock in the forenoon. But, at whatever time any bath is taken by any person, it ought always to be remembered that no one should bathe soon after eating;—three hours at least, should elapse after a hearty meal, before a bath is taken.

§ 1606. The vapor bath, as a remedial means, when properly employed, is highly grateful and salutary. The medicated vapor baths, as managed by Mr. Whitlaw and his followers, often proves exceedingly beneficial to those who are laboring under certain chronic diseases; and it is rarely injurious to any. I am inclined to think that sufficient attention has not been given to this means of cure, by physicians in general. By these remarks however, I intend to give no countenance to the indiscriminate steaming, which has become so extensive an instrument of presumptuous and impudent quackery at the present day.

§ 1607. Swimming, if well-timed and properly regulated, is an agreeable and healthy mode of bathing combined with exercise, for the young and vigorous. But boys who are allowed to indulge in this kind of bathing at pleasure—and especially boys of the city, are exceedingly apt to go into the water too frequently, and to remain in quite too long, and thereby very much impair their health, and often bring on violent disease, which soon

terminates in death. As a general rule, those who cannot swim ought not to remain in the cold bath over five minutes:—and those who do swim should not exceed thirty minutes. After taking any kind of bath, exercise, which promotes respiration and circulation and general determination to the surface, is very beneficial.

§ 1608. Much care should be given to the cleanliness of young children. Their bodies should be regularly washed all over, every day, with soft water and a very little good castile soap; and the skin should be wiped perfectly dry, and then exercised a little, either with the hand alone, or a piece of soft flannel. The tepid bath is of great service to children when laboring under diarrhoea, dysentery and many other complaints. But the bath should never be administered when their stomachs are full, or soon after eating.—Not only children, but persons at every period of life, may be astonishingly benefited by the proper use of the tepid sponge bath, in certain stages of fever, when the pulse is full and quick, the tongue dry, the thirst great, and the skin hot, without a sense of chilliness. I have seen effects almost miraculous, produced by sponging the body in such conditions, with tepid water containing a little soap or pearl-ash:—but much knowledge and sound judgment are necessary to govern such operations with safety; as an indiscriminate bathing in any mode may do great mischief. (§ 1526.)

§ 1609. In the use of the cold bath, in any manner, if the individual, after rubbing himself off briskly and clothing himself, finds that he is disagreeably chilly, unless he is conscious of having been in the water too long, he should avoid that kind of bathing, and perhaps confine himself to the tepid bath two or three times a week; or to the sponge bath, if he finds it pleasant and refreshing to him.

§ 1610. In concluding my remarks on bathing, I must repeat that it is exceedingly desirable to have every dwelling house furnished with a good bathing room and apparatus: and the expense of these things bears no proportion to the health and comfort they afford, and the money which they save in a family in the course of a few years.—It is wonderful that mankind at the present day, claiming as they do, to be so much more enlightened in science and useful knowledge than the ancients, should yet be so far behind them in matters of this kind. In the Mosaic dispensation, the most rigorous regard was paid to bathing, and cleanliness in every thing.—One of the highest luxuries of ancient Rome was bathing. The Mohammedans, the Hindoos and many other portions of the human family, perform their daily ablutions as a religious duty. Yet the most intelligent portions of Christendom neglect it.

§ 1611. Shaving of the beard is one of the evils which civic life has subjected man to: and we have now become so accustomed to it, that we regard the wearing of a long beard, as a very strong evidence of a man's insanity, or at least of very great eccentricity. And yet, if a new edition of the Bible were to come out with elegant engravings, representing the patriarchs and prophets and our Savior and the Evangelists without a beard, we should all be much shocked at the seeming sacrilege. Every intelligent mind that reflects on the subject must soon be convinced, that the true and full dignity of the male form in the human species, requires the presence of the full-grown beard, and no physiologist can doubt that the habitual shaving of the beard serves in some measure to diminish the physiological powers of man and to abbreviate the period of his existence.—Yet since custom compels us either to shave or to suffer banish-

ment from society, it is desirable to know how we can do the former with the most comfort. I have tried every expedient, and have learned both from science and experience, that they who would shave with the greatest comfort, should always use cold soft water in making their lather.—If the beard is hard and the skin tender, lather it well, and then wash off the soap in cold water, and then lather the beard thoroughly again, and shave with a sharp razor; and when this is done, let cold water be applied freely to the face and neck, and then let the parts be wiped dry.—The use of hot water in making a lather, and of cologne or any other heating wash after shaving, always serve to debilitate the skin and make it very tender, and to cause the face to bleed and smart during, and after the operation.—If any one will follow my advice six months, he will never return to the use of hot water in making his lather, nor to the use of cologne or spirits as a wash after shaving. If however, any one finds it necessary to use hard water, it may be heated to make the lather, which should be suffered to become cool before it is applied to the face.—Dipping the razor in hot water certainly makes it cut better.

§ 1612. What I have said of the beard is unquestionably true of the hair of the head. The angel who announced the birth of Sampson, declared that he should be a Nazarite from his birth:—and consequently that neither his beard nor his hair should ever be cut. Whether the sudden loss of Samson's wonderful strength on the cutting of his hair, was designed to teach mankind the natural relation between the hair and the strength;—or in other words, to teach us that the cutting of the hair serves to diminish the powers of the body, and abridge the period of life, I will not presume to say,—but certain it is, that such is, in some measure the effect. This effect how-

ever, is probably small, both in regard to the hair and the beard, when compared with most others, concerned in debilitating the human body and shortening the life of man; and there can be no question but that, many of the artificial modes in which females dress their hair, are far more injurious than the frequent cutting of it.—Various causes operate in civic life to destroy the hair, but probably the most numerous and efficient of them operate through the stomach. (§ 421.) When by any means however, the hair is diseased and baldness is threatened, the only remedy in nature, is to pay strict attention to the diet and general regimen,—cut the hair often and very short, and wash the head frequently all over in cold water, using occasionally a little mild soap, and follow the bathing with the brisk application of a good, clean, stiff hair brush. If this course, honestly pursued for several months, does not restore the hair to vigorous health, nothing will.—No dependence can be placed on the specifics that are advertised for improving the hair; and many of them do mischief.—All kinds of oil and perfumery for the hair should be avoided. The natural oil secreted by the appropriate vessels of the skin, (§ 333.) is all the hair requires, and the application of any other oil to it, always serves to suppress the natural, secretion, and to leave the hair drier in the end.—They who would improve the hair or any other part of their system, must pursue such a course as will improve the general health of the body, and make no other local applications than are consistent with the vital economy of the part and the general physiological interests of the system. (§ 423.)

Air.

1613. We have seen (§ 473. *et seq.*) that in the
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function of respiration, or breathing, a vital process is continually going on, by which a portion of the air received into the lungs, is digested and incorporated with the blood; not as oxygen, but as a vitally assimilated principle of the living blood, (§ 482.) and that by this function of the lungs, the grand process of digestion is completed, (§ 469.) and the arterial fluid is fitted for all the purposes of the system in the great function of nutrition. (§ 484. 485.)—We have seen also, (§ 731. *et seq.*) that, pure air is composed of twenty parts of oxygen and eighty parts of azote, by volume or measure, and that, the lungs, as living organs, are constitutionally adapted to air consisting of precisely these proportions; and consequently, every deviation from this point towards an excess either of azote or oxygen, is injurious to the lungs and to the physiological interests of the body. Hence, it is of the utmost importance that the lungs should be constantly supplied with pure air; not only for the preservation of their own health, but for the preservation of the integrity of their function, the health of the blood and the general welfare of the system.—But we have seen (§ 730.) that the whole external skin performs a function which in many respects, closely resembles that of the lungs: and that it not only appears to consume a portion of the oxygen of the air, but also like the lungs, is continually eliminating the excreted impurities of the blood; (§ 516.) among which, the chemist detects a considerable quantity of carbonic acid gas, (§ 143.) which, when received into the lungs without a mixture of atmospheric air, is almost instantly destructive to life;—causing an immediate suspension of all the powers of animal life; and if relief is not promptly afforded, organic life is very soon destroyed. (§ 479.)

Carbonic acid gas is formed in considerable quantities by decaying vegetable matter.—Living vegetables also give it off during the night; but consume it during the day. Much the greatest source of it, however, is animal respiration and perspiration. Hence, crowded assemblies in churches, theatres, hospitals, prisons, &c. rapidly consume the oxygen of the air and produce carbonic acid gas, and consequently, if such places are not well ventilated, the air will soon become impure; causing difficulty of breathing, vertigo, or dizziness of the head, nausea, faintness, trembling, relaxation of the voluntary muscles, slow and feeble pulse, spasms, asphyxia and death. In this manner, the lives of many have been destroyed;—but a vastly greater number has been cut off by plagues and putrid, and typhus and other fevers, brought on or excessively aggravated by impure air. And it is principally owing to the effect which a dense population has on the atmosphere, and to the want of proper ventilation, that cities are less healthy than the country.

§ 1614. We see therefore, that it is of very great importance that our habitations should be so situated and so constructed, as to admit of perfect ventilation in every part; and that our bedrooms in particular, should be large and airy: (§ 1596.) and that too many persons should not sleep in the same room. (§ 1597.) We perceive also, that it is of great importance that every person should have frequent and free access to the pure open air (§ 1613.) and it is equally important that at such times, every one should be capable of drinking in the sweet breath of heaven, without the least restraint;—of inflating the lungs fully and deeply, and freely expanding the chest without any artificial restriction whatever.

§ 1615. The effect of such a respiration of pure air, is

truly wonderful. When the careful mother has been shut up in her nursery or confined to her house, for a number of days in succession, diligently attending to maternal duties, or domestic concerns, till she begins to feel a nervous oppression and dull headache coming upon her, if she breaks away from her confinement, and walks or rides in the pure, open air, even for a few minutes, she feels a new life and a new spirit entering into her blood, and diffusing itself throughout her whole system: her languor, and depression and headache are dispelled, her eye becomes bright and sparkling, her countenance animated, her form more erect and stately, and her step more elastic and graceful; and she returns to her domestic empire, and household duties, almost a new creature, and seems to carry with her into that empire, and through all those duties, a new and salubrious atmosphere:—and if she is a nursing mother, her babe will be almost equally benefited by the consequent improvement of its natural food. Nor are such advantages confined to the mother. Every female and every studious and sedentary person, and every invalid that is able to move or to be moved in the open air, should endeavor to be abroad in it, as frequently as propriety and duty will admit.

§ 1616. The air bath, as Dr. Franklin calls it, is exceedingly salutary to every one in health, and to almost every invalid.—If the whole skin may be considered a breathing organ, (§ 1599.) then should it not only be kept clean, but for its own health and vigor, and the health and vigor of the whole system, it should be permitted to receive the full and free embraces of the pure air, at least twice in the twenty-four hours. Every morning and evening, the whole body should be exposed freely to the air, and the skin exercised with the flesh-

brush, a coarse towel or with the hand; (§ 1594. 1601.) and five or ten minutes spent in such exposure and exercise in the morning, will prove very salutary to every one who is not too far gone in disease to bear it.—Let it always be remembered that man was made for the open air:—it is his natural dwelling place, and the habit of cooping up in ceiled houses, is always in some measure detrimental to the physiological interests of the human constitution.

§ 1617. If there be one class of human beings to whom pure air is more essential than any other, it is young children;—they soon droop and become puny and diseased, if they are confined to impure air: and on the other hand, few things serve so much to impart health and vigor to sickly and puny children, as free access to the pure, open air of heaven. Nurseries ought therefore, to be thoroughly ventilated every day, and kept perfectly sweet and clean, and the air of them should not be consumed by too many lungs; and infants should be carried abroad as early and as freely as prudence will allow. And when children become old enough to run alone, they should be daily taken into the open air when the weather is pleasant.

§ 1618. Aged people also require great purity of air: and strict attention should be paid to the thorough ventilation of their rooms; and so long as they are able to walk or ride abroad, they should, when the weather is not too inclement, daily visit the open air: and when they can no longer do this, their habitations should be the more frequently ventilated.

§ 1619. In regard to the benefit to be derived from a change of climate, there is probably much popular error of opinion. Invalids, trusting too exclusively to the salubriousness of the country or sea air, or of a mild

climate, wholly or mostly neglect to attend to their diet, and regimen in general, and consequently, a large portion of those who travel in pursuit of health, either die abroad, or return home little or no better than they went:—whereas, if they would avail themselves of the advantages of a correct regimen throughout, as well as of pure air and a mild climate, they would far more generally recover health.—As a general rule, therefore, the air and climate of any portion of the United States, under a strictly correct general regimen, are much better for invalids of every description, than any other climate in the world, with an entire disregard to regimen.

Clothing.

§ 1620. Concerning clothing, I deem it necessary to say but little, and that little, for the most part, in general terms.—It is entirely certain that no kind of clothing is strictly natural to man:—or in other words, if man inhabited that climate to which his constitution is most perfectly adapted, (§ 1249.) his body would be more symmetrically and completely developed, and more elastic, agile and vigorous, and more perfectly and uniformly healthful,—his life would be longer,—his intellectual faculties would be more active and powerful,—his moral character would be more pure and virtuous,*—in short, all the physiological and psychological properties, powers and interests of the human consti-

* “The Zulus,” says the Rev. Mr. Grout, (§ 1178.) “depend on the products of the soil for subsistence, and go entirely naked. Licentiousness is wholly unknown among them.—I have been among them for three years,—seen them on all occasions,—have many a time seen hundreds of males and females huddled together in perfect nakedness, but never once saw the least manifestation of licentious feeling: and they are as remarkable for their intellectual activity and aptitude, as for their chastity.”

tution would be better sustained, as a permanent fact, from generation to generation, by entire nudity, than by the use of any kind of clothing.—Strictly speaking, therefore, all clothing is, in itself considered, in some measure an evil.—In passing into climates much colder than that to which he is constitutionally adapted, however, man finds it necessary to employ clothing to a greater or less extent, for the purpose of preserving the proper temperature of his body. (§ 129.)—In such a situation therefore, clothing becomes a *necessary evil*; and in so far as man suffers less from the injurious effects of clothing, in such a situation, than he would from cold without it, it is a comparative good:—that is, it prevents a greater evil than it causes. Nevertheless, as it cannot serve to adapt man so perfectly to such a situation, as to make it equally conducive to the highest well-being of the human constitution, with his natural climate, without clothing, (§ 1250.) it remains true as a general proposition, that clothing is in some measure, detrimental to the physiological interests of the human body.

§ 1621. But I hope I shall not be misunderstood in this reasoning.—My object is not to advocate bodily nudity in society;—though I cannot doubt that morality would be greatly improved by it, in the course of two or three generations, if in all other respects mankind conformed to the true laws of their nature;—but my sole object is so to explain the laws of constitution and relation established in the nature of man, as will enable him to regulate those artificial habits and customs, which society makes necessary, in such a manner as that they shall be in the least possible degree injurious.

§ 1622. If man were always to go entirely naked, the external skin, the anatomical structure and functional character and relations of which we have fully contem-

plated, (§ 1587. 1592.) would be preserved in a more healthy and vigorous state, and perform its functions more perfectly; and thereby, the whole human system in all its properties, powers and interests, would be benefited;—the circulation, and particularly the venous circulation which is near the surface (§ 485.) would be more free and unobstructed;—respiration or breathing (§ 473. *et seq.*) would also, be more free, full and perfect;—voluntary action would be more unrestrained and easy;—the bones would be less liable to disease and distortion:—all the muscles of voluntary motion (§ 194.) would be better developed and more powerful;—in short, the anatomical development and symmetrical proportion, and the physiological powers and functions of every part in the whole system, would be more perfect:—and, as a natural consequence, the sensual appetites would be more purely instinctive, and exert a less energetic and despotic influence on the mental and moral faculties (§ 608.) and the imagination would be deprived of its greatest power to do evil.

§ 1623. Clothing then, is an evil so far as it prevents a free circulation of pure air over the whole surface of the body, or in any manner relaxes and debilitates the skin, and increases its susceptibility to be unhealthily affected by changes of weather, and by the action of morbid agents; (§ 1587.)—it is an evil so far as, by compression or otherwise, it prevents a free and equal circulation and return of the blood;—it is an evil so far as it prevents the free action of the chest and lungs, or in any manner or measure restricts respiration;—it is an evil so far as it interferes in any degree, with the digestive organs;—it is an evil so far as it prevents the most perfect freedom of voluntary action, and ease and grace of motion and attitude, or prevents the full

development of any part of the system; or serves, by the substitution of artificial means for natural powers, (§ 1317.) to relax and debilitate the muscles, or render the tendons, ligaments, cartilages and bones less healthy and powerful, or in any measure to abridge the control of the WILL over any organ of voluntary motion;—it is an evil so far as it serves to increase the peculiar sensibility of any organ of animal instinct, and to augment the power of that instinct, on the intellectual and moral faculties;—it is an evil so far as it serves to enfeeble the intellectual faculties, and render the mind sluggish and sensual;—and it is an evil so far as it serves to excite an unchaste imagination, and cause the sexes to act towards each other, more from the impulse of animal feeling than from the dictate of sound reason.

§ 1624. The application of these general principles to the regulation of clothing, is perfectly easy, and cannot lead any intelligent mind into error.—It requires,—1st, that whatever climate man may inhabit, he should endeavor to preserve that state of general health and vigor of body, which will render the least quantity of clothing necessary for the preservation of a healthy temperature; —2d, that the materials used for clothing should, as far as consistent with the proper temperature of the body, be such as serve in the least degree, to relax and debilitate the skin, and through it, the whole system;—3d, that the clothing should be so adjusted as in the greatest possible measure, consistent with the proper temperature of the body, to admit of a free access of air to the whole surface, and of the most perfect freedom of circulation, respiration and voluntary action, and attitude: and—4th, that the fashion of the clothing should be such, as in the least possible degree, to excite an impure immagination.

§ 1625. After having so fully laid down the general

principles in regard to clothing, it is hardly necessary that I should say that corsets, stays, garters, and every kind of ligature or compression, and all kinds of tight dresses should be avoided; and especially by the young and growing; whose bodies are very easily, and almost inevitably diseased, deformed and distorted, to a greater or less extent, by such unnatural means.—The growing body should be as free as the air.—The flowing robes of the ancients, were incomparably more favorable to health and more graceful than modern dresses.

§ 1626. Much has been said by certain writers on hygiene, in favor of wearing flannels next to the skin; and undoubtedly, there are particular cases in which the habit being formed, had better be continued, than too suddenly abandoned. Yet it is certain that woolen serves to excite, relax and debilitate the skin and through it, the whole system, and thereby to increase the very evils which it is worn to prevent, more than cotton, linen and silk. (§ 1591.)—While therefore, I leave invalids and other individuals to govern themselves on this point, according to their particular circumstances and state of health, I lay it down as a general rule, with reference to the permanent interests of the human constitution, that it is better not to wear woolen next to the skin, when cotton, linen or silk under garments can be had.

§ 1627. What I have said concerning the regulation of the temperature of the body by means of clothing; is true in regard to the use of fire (§ 1317.)—In all cases it relaxes and debilitates the system, and diminishes the power of the body to regulate its own temperature: (§130. 500.) and therefore, the physiological interests of our bodies, require that we should, as far as possible, keep them warm by their own healthy and vigorous calorific function, (§499.) and only use fire as a necessary evil: and under such regulations as will not expose us to

greatly unequal temperatures at the same time, or to powerful heat on one side and severe cold on the other. Our rooms should be so warmed as to be of a mild and equal temperature in every part.

Exercise.

§ 1628. We have seen (§ 308—521.) that the human body consists mainly, of an assemblage of tubes, formed into a system of organs, and for the most part, filled with fluids of different qualities.—The arteries, veins, and capillary vessels, including the lymphatics, (§ 367—390.) compose a very large proportion of the whole bulk of the solids of the body: and all these—even the most minute—are ducts for some kind of fluid:—so that, the fluids of the body, form by far the greatest part of its weight:—probably not varying much from nine-tenths, in a healthy adult body of middle age.—These fluids are, or should be, continually in motion, and as well as the solids, constantly undergoing changes in their constituent particles. (§ 314.) The food received into the stomach is digested into chyme (§ 429. *et seq.*) from this, is elaborated the chyle, (§ 455. *et seq.*) from this, is formed the blood, (§ 473. *et seq.*) and from the blood, all the solids of the body are formed, (§ 503. *et seq.*) and the salivary and gastric and pancreatic and all other fluids employed in the operations of the vital economy, are secreted; (§ 507.) and all those fluids and substances are excreted which are eliminated from the body, in its depurating or cleansing functions. (§ 516.)

§ 1629. To keep up this grand, vital circulation, and to give vigor to all the vital functions, and perfectness to all the vital changes, and to secure a proper supply of blood to every part, and maintain the general health and

energy of the system, EXERCISE or voluntary action is of the utmost importance. It greatly promotes circulation; (§485.) and particularly in the capillary system, or the myriads of minute vessels which are so numerously distributed to every part of the body: (§ 375.) it equally promotes respiration; causing full and deep inspirations of air, and a vigorous action of the lungs, (§ 473. *et seq.*) and serves to impart vigor and activity to all the organs, and to secure the healthful integrity and energy of all the functions; and the symmetrical development and constitutional power of the whole system; and gives strength and agility and elasticity and grace to the body, and energy and activity to the intellectual and moral faculties. Indeed, exercise may truly be considered the most important natural *tonic* of the body. If it is wholly neglected, the body will become feeble and all its physiological powers will be diminished:—but if it is regularly and properly attended to, the whole system will be invigorated, and fitted for usefulness and enjoyment.

§ 1630 We have seen (§ 192. 376.) that every contraction of the muscles serves to exhaust their vital properties; and to replenish this exhaustion, a constant supply of fresh arterial blood is diffused throughout the muscular tissue in great abundance; (§ 393.) and the more vigorously any part is exercised, the more rapidly and abundantly that part is supplied with arterial blood: and hence, the habitual, healthy and vigorous exercise of any part, always serves to produce and maintain a full development of that part and to give it great power. (§ 1019.) Thus, if one arm is constantly and vigorously exercised, and the other remains wholly unemployed, the muscles of the former, will soon be much more largely developed and far more powerful than those of the latter.—Hence, the welfare of the whole system, requires that each part should

be duly exercised; and most especially in young and growing bodies, which are easily deformed and even dreadfully distorted by a neglect of voluntary action.

§ 1631. We see then, that as exercise promotes and invigorates all the vital functions of the body, and considerably increases the insensible evacuations, it is important that a certain relation should always be observed between the quantity of food received and the amount of exercise taken. (§ 1449.) They who are employed in active labor in the open air, require more food than persons of sedentary and inactive habits: though as I have stated, (§ 1495.) the most active and robust laborer, should never take more food than is really needed by the vital economy of his body, and they who neglect exercise and “feed themselves without fear,” will certainly cause, either a reaction upon the digestive organs, inducing dyspepsy and perhaps organic disease in the stomach or intestinal tube, or general or local congestion, resulting in fever, or local disease of some kind or other. (§ 1486.) Moreover, such people will inevitably impair their intellectual and moral powers;—causing mental dulness and stupidity, and blunting the moral sensibilities and increasing the relative influence of the more exclusively selfish propensities and passions. (§ 1242.)—We see also, that exercise in order to be the most salutary, should be as much as possible in the pure open air, (§ 1615.) and the body and limbs should be perfectly free, and unrestrained by any thing that is calculated to prevent the full expansion of the chest, the deep inspiration of air, the free circulation of the blood, the vigorous functions of the skin and the easy and natural motion of every part. (§ 1624.)

§ 1632. A certain amount of exercise or labor is therefore, as essential to the highest welfare of man, as

food or air.—By a rigidly abstemious diet, he may live on, with an exemption from actual disease, and perhaps, attain to what we call old age, with very little active exercise. But in such a life, he can never know that vigor of body and mind,—that perfectness of health,—that vivacity and buoyancy of spirit,—that habitual serenity and cheerfulness and high enjoyment, of which his nature is capable.—But we have seen (§ 376.) that every vital action is attended with an expenditure of vital power and waste of organized substance, and (§ 886.) that every vital function necessarily draws something from the ultimate and unreplenishable fund of life. Hence, so far as voluntary exercise or labor is necessary to the most healthy condition, and perfect functions of the human system, it is a blessing; and beyond that, it is in some measure an evil: for in proportion to the excess, life is always shortened, and the body predisposed to disease. (§ 1483.)

§1633. From constitutional necessity therefore, if man takes too little voluntary exercise, he suffers; and if his voluntary exercise is excessive, he suffers. But happily for the race, the sufferings from excessive labor, bear no proportion to those which result from inactivity.—A man may greatly abbreviate his life by over toiling, and yet, through the whole of his earthly existence, enjoy comparatively good health, sweet sleep and a cheerful mind: but he who suffers from want of exercise—and especially, if with that, is connected excessive alimentation, and other dietetic errors—experiences the bitterest and most intolerable of human misery.

§1634. Beyond all question, the natural employment of man, so far as labor is considered, is the cultivation of the soil: and it is equally certain, that if all the circumstances and habits of man, were in accordance

with the laws of his nature, four hours a day, of productive labor, would amply sustain the human family: and this is just about the amount of labor, which the highest good of every one requires.—But, if some fall greatly short of this amount of productive labor, others must proportionably exceed it: and thus both classes become sufferers.—This is the present state of things in the human world.—Multitudes are living without productive labor, and greater multitudes are consequently compelled to labor to excess.—But let not the laborer envy the drone; for toil and poverty with health and cheerfulness, are rich blessings when compared with the miseries which are endured by nearly all who live without active labor.

§ 1635. In the present state of things however, the structure of society in civic life, requires that many should be devoted to pursuits, which are less favorable to health than the calling of the husbandman: and a large majority of these pursuits are of a nature which does not admit of sufficient active, bodily exercise for health and comfort. To all such therefore, exercise becomes a necessary part of regimen, and must be regularly attended to, or they must suffer. And yet, where it is a mere matter of regimen,—attended to because it cannot be neglected without suffering, it loses more than half its virtue. Exercise in order to be most beneficial, must be enjoyed.—The mind must enter into it with interest, and if possible, with delight,—losing the idea of labor in that of pleasure: and hence, exercise connected with social amusements which are favorable to health, and strictly compatible with sound morality, is peculiarly beneficial. Walking, which is one of the most natural, and healthful modes of exercise, is doubly salutary when it can be connected with social enjoyment, and hearty cheerfulness;

and varied with occasional running, leaping, &c. according to the strength and agility of the individual. Riding on horseback, which in the present artificial state of things, is the most salutary and efficient kind of exercise known in civic life, for those invalids who are unable to take a more active kind, though always beneficial, is more than doubly so, when the idea of riding for health, is wholly lost in the pleasure of the ride, or engrossed in some pleasing interest of the occasion. And so, of all kinds of salutary and well regulated exercise, the more completely all considerations of health-seeking, are lost in the enjoyment and pleasure of the occasion, the more healthful will be the effect.—Even the varied exercises of the gymnasium, which are admirably adapted to develop and invigorate every part of the body, are rendered far more beneficial by being performed with spirit and ambition and vivacity and cheerfulness.

§ 1636. The salutary influence of animating music, connected with exercise, is very great:—in fact, it may almost be said to be medicinal; for it actually has the most healthful effect on all the vital functions of the body; and hence, dancing, when properly regulated, is one of the most salutary kinds of social enjoyment, ever practiced in civic life: and every enlightened philanthropist must regret to see it give place to any other kind of amusement.—The religious prejudice against dancing, is altogether ill founded: for it is entirely certain that this kind of social enjoyment, when properly regulated, is more favorable to good health, sound morality, and true religion, than perhaps any other known in society. It is infinitely better that people should come together to sing and dance, in the healthful exhilaration of their spirits, than that they should come together to eat and drink, or to seek enjoyment in almost any of the modes of social

entertainment in civic life; or that they should endure a miserable existence in moping melancholy, for want of proper exercise and relaxation.

§ 1637. Let me not be misunderstood however.—I do not intend to encourage the assembling of young people together at public taverns and hotels, and spending the night in dancing, eating, drinking, and other improprieties: (§ 692.)—but I would have this kind of exercise mostly confined to the domestic and social circles.—Vocal music ought to be as universal a branch of education as reading and writing: and instrumental music should be almost as extensively cultivated.—If I could have my wish, the violin—the best musical instrument ever invented—should be played in every family in the civilized world,—and every evening, when the duties and the cares of the day were completed, the whole domestic circle,—parents and grand parents,—children and grand children,—all that could move with comfort, should have an opportunity to join in the dance.—Even those who had been engaged in active labor through the day, would be refreshed by it; and those who had been confined by sedentary employment, would be exceedingly benefited;—the old would be made younger, and the young would be invigorated;—the social feelings would be improved;—sleep would be more sound and refreshing; and all would be made more healthy, more happy and more virtuous. For true health and true virtue are more nearly allied than is generally supposed.—“ How can they addict themselves to the practice of virtue, and to the service of God,” says Plato, “ who are ever caring for their own miserable bodies ? ”

§ 1638. If music, marching and dancing, constituted a part of the regular exercises, of all our colleges, theological seminaries, and other literary and scientific insti-

tutions, immense benefits would result, not only to those institutions, but to society at large.—Thousands who now pass from the place of learning to years of misery and an untimely grave, would be preserved in health, and live to be blessed and to bless mankind by their usefulness.

§ 1639. It is hardly necessary to say that children and youths of both sexes, require much exercise in the open air, for the healthful and symmetrical development of their bodies and for the establishment of a vigorous constitution. (§ 1265. 1504. 1597. 1617. 1630.)—Children, as we have seen, (§ 681. 687.) are instinctively inclined to action;—even before they can stand or sit alone, they love to keep their little limbs almost continually in motion, while they are awake; and as soon as they are able to run alone, they delight to be constantly in action:—and when they are old enough to be abroad in the open air, they find their greatest enjoyment in those amusements and sports which are of the most active kind.—Action is therefore, as instinctively natural to children as breathing, and it is unnatural and improper to restrain them from it, and to keep them in a state of confinement or inaction, for any considerable time. Their little bodies become painfully weary, if they are compelled to remain in one position for half an hour at a time, and it is cruel to repress their instinctive desire for action, beyond what is necessary for their proper discipline.—Girls should be allowed as much freedom of action in childhood, as boys, and they should be encouraged to exercise freely in the open air, while their bodies are growing.—Not only their own individual welfare requires this, but the good of the race demands it.

§ 1640. Aged people, after they have retired from the active employments of life, must keep up their regular

exercise, or they will soon become feeble and infirm.—It is impossible for the vigor and activity of the body to be long preserved without exercise.—Walking and horse-back-riding are among the best modes of exercise for the aged. Riding in easy carriages will do for very feeble persons who are able to take an airing; but it affords little exercise to the body:—plain waggons without springs are far more beneficial as means of exercise to those who can bear them.—With the aged, as with all others, exercise is most salutary when accompanied with cheerfulness.—Occasional hilarity and a hearty laugh, healthfully exhilarate and exercise the whole system.—It should also be remembered by the aged, as a most important truth, that the regular exercise of the mind is not only the necessary means of preventing the rapid decline of the intellectual powers in advanced years, but that it also serves in no small measure to prolong life and enjoyment.

§ 1641. The importance of exercise as the *natural tonic* of the body, is greatly overlooked and exceedingly neglected, in the treatment of chronic diseases of every kind; (§ 1629.) and irritating and deleterious stimulants (§ 1539. *et seq.*) are employed to produce those effects in the system which can healthfully result only from proper exercise and pure air.—Dyspeptic and other chronic invalids ought never to hope for health by any means, without *exercise*.—The beneficial effects of horse-back-riding, to those who are laboring under pulmonary consumption, are often truly astonishing. I have known invalids afflicted with this dreadful disease, when they were too feeble to mount the horse without help, by riding a short distance the first time, and gradually increasing the length of the ride daily, become able, in the course of two weeks, to ride twenty miles without stop-

ping by the way, and feel more vigorous at the end of the journey, than at the beginning:—and I have known instances in which such individuals have made journeys on horseback, of several hundred miles, and returned to their homes and friends, almost perfectly restored to health.—Indeed, I am entirely confident that if strict simplicity and propriety of diet, and riding on horseback to the full extent of the patient's ability, will not cure pulmonary consumption, no earthly means can cure it:—and I am very certain that most other means employed in modern times, while they may perhaps, seem to alleviate the symptoms, really aggravate the disease and hasten the patient to the grave.

Voluntary Evacuations.

1642. The regular action of the bowels is of the utmost importance to health.—The evils, both bodily and mental, resulting from habitual costiveness, are incalculable: and yet, there is reason to believe that this habit of body is exceedingly common in civic life; (§ 1355.) and particularly with young females.—Mothers and all who have the care of children and youths of both sexes, ought to pay great attention to this matter: for they may be assured that it cannot be neglected without much hazard to the health and life of the young.—Habitual costiveness predisposes to dyspepsy, pulmonary consumption, nervous disorders, headache, insanity, and indeed, almost every distressing form of disease that flesh is heir to:—and when it does not actually develop diseases in youth, it lays a deep and immoveable foundation for it in after life.—Every body should have a regular and free action of the bowels once in twenty-four hours: and the dietetic and other habits should be so regulated as to secure this.

A P P E N D I X.

NOTE A. REFERRED TO IN § 1175. 1265.

THE Orphan Asylum of Albany, N. Y., was founded in December, 1829. Orphans and other destitute children of the city, were gathered into it, to the number of from seventy to a hundred and thirty.—The house at first occupied, was too small for the good accommodation of so large a number; but great pains were taken to keep it clean and well ventilated. One room was set apart for a nursery or sick room, and a woman, with sometimes one or two assistants, employed to nurse the sick and feeble. Drs. Janies and Green were the attending physicians. Great attention was paid to the personal cleanliness of the children, and their regimen generally as to bathing, clothing, air, exercise, &c., was intended to preserve and promote health. Their diet consisted of fine bread, rice, Indian puddings, potatoes, and other vegetables and fruit, with milk; and to these was added flesh or flesh soup once a day.

A large and commodious house having been built for the purpose, the children were removed to it, in April, 1833. In September, 1833, a change was commenced in the diet of the children, and in the course of three months, they were brought fully into what is popularly called "the Graham system of living."—In August, 1836, the following account of the institution was published:—

"It is now more than six years since this institution was established, and about three since the new regimen was adopted,—so that the time has been nearly equally divided between the regimen which embraced animal food and that which excluded it. From the commencement to the present time, new inmates have been occasionally received into the asylum from the almshouse and from the city, and most of these children have been in very poor health, and some of them exceedingly diseased. During the whole period, also, children have from time to time, been placed out in families, when they had arrived at a proper age.

"The average number of children in the asylum, has been about eighty. During the first three years, the changes were somewhat more frequent than they have been during the last; but during the last three years, there has been a larger proportion of very small children. Under the first regimen the children were washed all over once in two or three weeks; under the new regimen they have been washed all over every morning in the summer, and three times a week in the winter. Under the new regimen, the house has been much larger and more airy and convenient than that which was occupied most of the time while under the old regimen. Now then, let us look at the general results. During the first three years, or while the first regimen was observed, from four to six children were continually upon the sick list in the nursery, and a nurse constantly employed to take care of them,

and sometimes, the number of the sick was greatly increased and one or two assistant nurses necessary. The attendance of a physician was found necessary once, twice, or three times a week uniformly, and deaths were frequent. In the summer of 1832, the epidemic cholera made its appearance among the children of the asylum and carried off six or eight of them:—and let it be observed, that during the cholera season, the proportion of flesh and flesh soups was considerably increased in the diet of the children. During the whole period of the first three there were twenty-eight deaths.

“ The new regimen, it has been stated, was gradually introduced at the close of 1833. While this change was taking place, a child was received into the asylum, diseased with scald head. This disease, when once introduced into such an institution, is rarely arrested till every inmate has had it, and it sometimes takes years to expel it; but in this instance it was so promptly and vigorously met by a salutary regimen, that it was wholly arrested and driven from the institution before it had extended to half of the children. The nursery was soon entirely vacated and the services of the nurse and physician no longer needed,—and for more than two years following, no case of death nor of sickness took place in the asylum. Within the last twelve months there have been three deaths in the institution. One of them was an idiot child received some months before from the almshouse; this child was of extremely imperfect organization, and low order of vitality; its bones were soft and flexible, and in all respects it was so miserable a mass of organic existence, when brought to the asylum, that no one expected it would long survive.—It however continued to live on for several months, and then died suddenly. The second case was also an idiot child, received from the almshouse in a bad state of disease, and died soon after it was brought to the asylum.—The third case was a child which likewise came from the almshouse in an advanced stage of disease, and died very soon after it was received into the asylum. At the same time two or three other children were received from the almshouse wretchedly diseased, but they have been restored to health.

“ We see, therefore, that excepting the scald head brought into the asylum at the very commencement of its new regimen, and the few cases of disease imported from the almshouse within the last year; and excepting the death of the two idiots and one other child, all of which came to the institution with the grasp of death upon them, there has been no case of death nor of disease in the asylum during the last three years, or since the new regimen has been adopted. And therefore, it is speaking truth most strictly, to say that not a single case of death nor of disease has taken place in the institution within the last three years, from causes existing in the asylum: on the contrary, (to use the language of the Report of the Board of Managers)—‘ under this system of dietetics, the health of the children has not only been preserved, but those who came to the asylum sickly and weak have become healthy and strong, and greatly increased in activity, in cheerfulness and in happiness.’ It may be said by some that most of this remarkable improvement is attributable mainly if not wholly to the change of situation; but let it be remembered that the old regimen was continued five months after the children were removed to the new house which

they have since occupied, and that but little apparent improvement in the health of the children took place before the new regimen was adopted: up to the very period at which the change was commenced, the nursery was continued, and on the day when they began to adopt the new regimen, there were six children on the sick list. But almost from that very day, there began to be a manifest improvement in the health of the children, and in a short time, the nursery was wholly vacated, and has ever since been entirely unoccupied, except temporarily, by the few cases of imported disease, already mentioned.

"Miss Grimwood, the superintendent, and Miss Clark, the principal teacher, state that since the new regimen has been fully adopted, there has been a remarkable increase of health, strength, activity, vivacity, cheerfulness and contentment, among the children. Indeed, they appear uniformly, to be perfectly healthy and happy, and the strength and activity which they exhibit are truly surprising.

"That an airy situation, and a clean and well ventilated house, are of prime importance to the health of such an institution, no one who understands the subject, can entertain a doubt; but in order to arrive at correct conclusions in matters of this kind, every particular and circumstance should be carefully examined and justly estimated. In the case before us, it is fully evident that the change of situation was neither the sole nor the principal cause of the astonishing improvement in the health of the children. Nor can we justly consider the substitution of the coarse for the fine bread, nor the abandonment of animal food, the sole cause of such an improvement; but the improvement resulted from the co-operation of all these causes: it was the effect of a correct regimen throughout, embracing the diet, sleeping, bathing, clothing, exercise and intellectual and moral discipline. And such a regimen, adapted to the physiological laws of human nature, constitutes what is called 'the Graham system.'

"Miss Grimwood and Miss Clark also state that the change in the temper and disposition of the children since they have adopted their new regimen, is very great; they have become less turbulent and irritable and peevish and discontented, and far more manageable and gentle and peaceable and kind to each other;—and this, say the superintendents, is not the result of a want of spirit and energy, but of a healthy state of the whole system—a general serenity—an absence of morbid irritation.

"'The effect of the new regimen on the intellectual powers of the children,' says Miss Clark, 'has been too obvious and too striking to be doubted. There has been a great increase in their mental activity and power:—the quickness and acumen of their perception, the vigor of their apprehension, the discriminating energy of their comprehension, and the power of their retention, daily astonish me!'

From August, 1836, at which time the foregoing account was written, until November following, the children of the asylum all continued in excellent health. In November two of them were somewhat indisposed for two or three days, and then recovered their usual health, and all continued well until March, 1837. In the second week of March the small pox appeared in the asylum, and in twenty-four hours, six of the children exhibited symptoms of that disease: or, as the event proved, three of them had the genuine small pox, and three of them the

varioloid. These children were from three to twelve years of age. Alarming as this disease is considered, it was here nearly stripped of its terrors; for it was so mild as scarcely to interrupt the regular proceedings of the institution. One little girl was remarkably full of the genuine small pox, yet she was scarcely ill at all, and did not complain in the least, nor did she take any medicine. All she wanted was brown bread. Indeed, this was the only thing that any of them seemed to crave while the disease was upon them. A little boy four years of age, who had been about nine months in the asylum, and who came there in very full habit, and had evidently been accustomed to gross living, and was from the first, much afflicted with worms, had the small pox far more severely than any other child, and the disease left him much more exhausted than it did any of the others. This little fellow had scarcely thrown off the small pox before he was taken, in his feebleness and exhaustion, with the hooping cough, and in spite of every care, sunk under his complicated difficulties and died. Another little boy had the small pox very full, but he hardly seemed to mind it at all, and soon threw off the disease as a light and harmless thing. By an untimely accident however, he was exceedingly exposed at the moment he began to recover, and took a violent cold: the lung fever set in, and after four or five days' sickness he died. The three children which had the varioloid were so lightly affected that their indisposition was scarcely perceptible. In fact, except in the case of the little boy troubled with worms, the disease was so light and mild in all the children, that it hardly made any change in their diet, studies, or amusements and play; and the disease did not seem to impair their constitution in the least:—they rose from it at once, and went on as if they had not been sick.

Almost immediately after the small pox had left the asylum, the hooping cough made its appearance there, and eight or ten of the small children had it. Excepting the little boy already named, whom it found afflicted with worms and extremely exhausted from small pox, none of them minded this last disease at all. They continued in school as usual—atc and played as usual. They occasioned no trouble during the night; nothing was given them but their usual food and drink: and nothing extra was done for them. Their cough was very light and easy: and none of them complained.

After the hooping cough had left the asylum, all its inmates remained in good health for about six weeks or two months.

About the first of June, 1837, wheat being very scarce and high-priced, and those who provided for the asylum, not being aware of the importance of the children's being supplied with the unbolted wheat meal bread, furnished the institution with fine flour made of foreign wheat, which had been a little heated during the passage. When the children commenced eating bread made of this flour they were all in fine health: but they had not continued to eat it more than four weeks, before about fifteen or twenty of them began to have sore eyes, and in the course of three or four weeks more, there were thirty cases of scarlet fever, and of these, two terminated in death. Still, however, this disease was so modified by the general regimen of the institution, that not more than three or four out of the thirty subject to it, were confined to their beds by it, nor did they require much extra attention.

That there was a very close relation, as to cause, between the sore eyes and the scarlet fever, was at least strongly indicated by the fact that no child which had sore eyes, had the scarlet fever.

About the first of September the asylum was again furnished with a small supply of unbolted wheat meal, and from this time till the first of January, 1838, all the inmates of the institution enjoyed excellent health. At the commencement of the present year some change took place in the board of managers, and a new caterer was appointed, who supplied the institution with fine flour of second quality, but sweet and good. In the course of three or four weeks from the time the children commenced eating the bread made of fine flour, a number of them began to have sore eyes again. The superintendent, now feeling confident of the cause of this complaint, stated her convictions to some of the managers, and told them that the children must have the coarse wheat, meal bread or their health could not be preserved. In the mean time, she endeavored to make the evil as light as possible, by giving the children very little of the fine bread, and sustaining them principally on good potatoes and apples. Very soon after this, however, a full supply of the coarse flour came, and from that time to the present,—now about five months,—the health of all the inmates of the asylum has been excellent and uninterrupted.

Albany, June 12, 1838.

VOCABULARY, OR DEFINITIONS.

ABNORMAL, irregular, deformed, out of the truly natural state, condition, order, or manner.	Aperient, opening, laxative.
Acute disease, disease which comes on suddenly, with violent symptoms, and soon comes to a crisis.	Asphyxia, a suspension of the action of the heart and arteries, as in swooning, fainting.
Alimentary canal, the stomach and intestines: the cavity which receives and digests the food, § 317.	Atony, relaxation, debility, want of tone, § 1190. Note.
Albuminous, partaking of albumen, or a substance like the white of an egg.	Auricle, (a little ear,) applied to the two upper cavities of the heart, which resemble an ear, § 368.
Anastomosis, properly, the communication of one vessel with another:—when applied to other tissues it means to unite, to join, to run one into another.	Bronchia, the branches of the wind-pipe in the lungs.
Anus, the mouth of the rectum through which the faeces are discharged.	Cachectic, a vitiated state of the solids and fluids, a general want of health and tone.
Aorta, the great arterial or principal blood-vessel leading from the heart, § 374.	Calculi, (plural of calculus) concretions, stone-like substances formed in the bladder, kidneys, gall-bladder, &c.
	Caliber, the diameter of a body—the capacity of a tube.
	Calorific, producing heat, § 499.
	Capillary, very small, hair-sized.
	Cerebrum, the brain, § 265.

Cerebellum, the little brain, § 264.
 Cerebro-spinal, the brain and spinal marrow taken together, § 229.
 Cervicle, belonging to the neck, § 180.
 Chronic disease, disease of long standing, which comes on by imperceptible degrees.
 Chyle, the fluid formed from the chyme, and from which the blood is formed, § 153. 466.
 Chylopoietic, having the power to form chyle.
 Chyme, the digested food in the alimentary cavity, § 435.
 Cineritious, having the color of ashes.
 Cœcum, a portion of the large intestine, § 346.
 Colon, the main portion of the large intestine, § 338. 346.
 Congestion, an accumulation of blood in a part, an over-fulness of the vessels.
 Corpora quadrigemina, four small ganglions lying at the top of the Medulla Oblongata, § 250.
 Corpus Callosum, the great commissure of the brain, § 267. 271.
 Corpusele, an extremely small body, a minute particle.
 Crassamentum, the clot, or thick, red part of the blood which separates from the serum, § 492.
 Cribriform, resembling a sieve or riddle—perforated with many holes.
 Cutis vera, the true skin.
 Diaphragm, the membranous partition which divides the body into two large cavities, § 175. 363.
 Diabetes, disease of the kidneys, producing an excessive quantity of urine.
 Depurating, cleansing, purifying.
 Duodenum, the first twelve inches of the small intestine, § 338.
 Emphysematous, inflated, blown up, distended with air.
 Encephalic, within the skull, the contents of the cranium.
 Epigastric, round about the stomach.

Epi-glottis, the little valve that closes the top of the windpipe in the act of swallowing, § 340.
Et seq., (*et sequitur,*) and the following.
 Facial, pertaining to the face.
 Fascicle, a little bundle.
 Fauces, the throat, the cavity behind the tongue.
 Fibro-cartilage, cartilaginous structure with fibrous arrangement.
 Filamentary, thread-like.
 Final cause, the purpose or end for which a thing is made, or exists.
 Follicle, a little glandular sac, § 333.
 Foramen, a hole, an opening.
 Function, the office of an organ:—thus, digestion is the function of the stomach.
 Functional, pertaining to function.
 Functional result, the effect of function:—thus, chyme is the functional result of digestion.
 Ganglion, a knot—a bulbous enlargement of nervous substance, § 226.
 Gastric, belonging to the stomach.
 Glosso-pharangeal, belonging to the tongue and pharynx.
 Glottis, the opening or mouth at the top of the windpipe, § 354.
 Hepatic, belonging to the liver.
 Humoral pathology, disease as connected with the humors or fluids of the body.
 Hypoglossal, under the tongue.
 Idiopathic disease, an original disease of some particular part, one that is not sympathetic, does not spring from another.
 Idiosyncrasy, a peculiar temperament or predisposition.
 Ileo-cœcal, pertaining to the ileum and cœcum, § 346.
 Ingesta, the contents of the stomach after a meal is made.
 Inorganic, not being arranged into organs, or by organs; stones and all substances not vegetable nor animal are inorganic.
 Inosculate, to unite—the mouth of one vessel opening into another.
 Jejunum, the second portion of the

small intestine, so called because mostly found empty, § 338.

Lacteals, small vessels that form the chyle and convey it to the thoracic duct, § 387.

Lamina, plates or sheets.

Larynx, the top of the windpipe, § 353. 354.

Lymphatics, small vessels that form the lymph and convey it to the blood-vessels, § 385.

Medulla Oblongata, the head of the spinal marrow, § 244.

Menstruum, a dissolvent, a fluid holding other substances in a liquid state, § 492.

Meso-colon, the membrane which as a curtain holds the colon in its place, § 350.

Mesentery, the curtain of the small intestine, § 350.

Molecular, pertaining to molecules or minute atoms.

Morbid, diseased, unhealthy.

Mucous membrane, the membrane which lines the stomach, lungs, &c. § 289.

Nasal fossæ, the canals of the nose.

Normal, the truly natural and proper state, form, condition, action, &c.

Œsophagus, the meatpipe. § 338.

Olivary bodies, portions of the Medulla Oblongata, § 244.

Omenta, the caul or the fatty curtains that cover the bowels, § 350.

Ophthalmic, pertaining to the eye.

Organic, having organs, or being organized, any vegetable or animal body, or any solid substance belonging to such bodies.

Osseous, bony. Ossification—formation of bone.

Papillæ, the little velvety tufts or eminences formed by the fine terminations of nerves and vessels, § 287.

Pancreas, a gland lying behind the stomach, § 342.

Pathology, the science of disease, every thing pertaining to disease.

Pelvis, the basin formed by the hip bones and others at the lower part of the trunk.

Pericardium, the membranous sac that surrounds the heart, § 368.

Periosteum, the fibrous membrane that surrounds the bones, § 169.

Peristaltic, the worm-like motion of the intestines, § 455.

Peritoneum, the outer coat of the stomach and intestines, § 350.

Pharynx, the funnel-shaped muscular bag at the top of the meatpipe, § 338. 347.

Phrenitis, delirium or phrensy from inflammation of the brain, &c.

Physiology, the science of life, comprehending all the vital properties, powers, functions and laws of living bodies.

Physiological depression, a state of exhaustion, and relaxation, and want of tone or energy, § 1190.

Physiologico-psychological science, intellectual and moral physiology: or the science of man's intellectual and moral nature as connected with the organs and functions of the living body.

Pleura, the membrane that lines the chest, &c. § 361.

Plexus, a net-work of nerves or vessels.

Pneumo-gastric, pertaining to the lungs and stomach.

Preternatural, more than is natural, or consistent with sound health.

Prophylactic, preserving health, conducive to health.

Psychology, the doctrine of the soul, including all the properties, powers, functions and laws of the intellectual and moral nature of man.

Puerperal, pertaining to child-bearing.

Pulmonary, belonging to the lungs.

Pylorus, the muscular ring at the lower orifice of the stomach, § 347.

Ramuscles, minute branches.

Rectum, the lower part of the large intestine, § 338.

Renal, pertaining to the kidneys.

Rugæ, the wrinkles or small folds of the stomach, § 349.	Tissue, a particular arrangement of fibres or filaments in an organ, § 313.
Saponaceous, having the quality of soap.	Therapeutics, the discovery and application of remedies in curing disease.
Seirrous, indurated, hard, knotty.	Traehia, the windpipe.
Sebaceous follicles, producing an oily or fatty substance.	Trisfæcial Nerve, the nerve of sensation, &c. with three branches distributed to the face, &c. § 254. <i>et seq.</i>
Secernent, secreting, as follicles and glands, § 333.	Trisplanchnic Nerve, see § 220.
Semilunar ganglion, the central brain of organic life, § 226.	Turgescence, swollen, enlarged.
Sero-fibrous, partaking of the character of the serous and fibrous structure.	Vaseular, consisting of vessels, see § 313.
Serous, thin, watery; like whey.	Vasculo-nervous, consisting of vessels and nerves, § 287.
Serous membrane, the membrane which lines the closed cavities and exhales a thin watery fluid or vapor, § 176. 350.	Vena Cava, the great venous trunk, see § 378.
Serum, the watery part of the blood, § 492.	Vena Porta, a particular apparatus of veins connecting the alimentary canal and liver, see § 381.
Solar Plexus, the great central nervous plexus of the body, § 226.	Venous blood, the dark purple blood of the veins.
Stamina, the fundamental powers of the constitution.	Villi, the velvety pile of the mucous membrane § 287.
Tissue, Cellular, Muscular and Nervous, the three general forms of structure in the body, § 312.	Viseera, the internal organs, see § 313.
	Vulnerary, adapted to heal wounds.

ERRATA.

Page 20, sixth line from the bottom, read "nearly as common."
 " 92, second line from the top, read "natural advantages."
 " 237, third line from the bottom, read "almost continually."
 " 276, bottom line, and first of 277, read "threatened with, and frequently suffering extensive distress."
 " 409, ninth line from the bottom, read "from the path of duty."
 There are several typographical errors, letters missing, &c. which the reader will readily correct.

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